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EIGHTH MENDELEYEV CONGRESS ON GENERAL  
AND APPLIED CHEMISTRY

- USSR -

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EIGHTH MENDELEYEV CONGRESS OF GENERAL AND APPLIED CHEMISTRY  
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Plenary Sessions  
Section of Inorganic Chemistry and Technology  
Section of Organic Chemistry and Technology  
Section of Analytical Chemistry  
Section of Physical Chemistry  
Section of Colloid Chemistry  
Section of Chemistry and Technology of Polymers  
Section of Natural Compounds and Biochemistry  
Section of Agricultural Chemistry and  
Insectofungicides  
Section of Chemistry and Chemical Technology  
of Fuel  
Section of Chemistry and Technology of  
Food Products  
Section of Chemistry and Technology of Silicates  
Section of Radiochemistry and Chemistry of  
Isotopes  
Section of Theoretical and Applied  
Electrochemistry  
Section of Chemistry of Metals and Alloys  
Section of Economics, Planning and Organization  
of Chemical Production  
Section of Chemical Engineering  
Section of History of Chemistry and  
Chemical Technology  
Symposium on Higher Chemical and Technological  
Education  
Commission on Chemical Nomenclature

Chemical meetings known as the Mendeleev Congress were instituted in Russia in 1907, on the initiative of the Russian Physico-Chemical Society, and were named in honor of the originator of the Periodic Law -- D.I. Mendeleev.

The first Mendeleev Congress took place at Petersburg on 20-30 December 1907. The calling of the congress was motivated by wants of growing Russian science, as well as by needs of the industry [1].

The second congress took place in December 1911, also at Petersburg. At both these meetings were extolled the contributions made by D.I. Mendeleev in the field of chemistry, physics, meteorology, in technology of petroleum and explosives, in metrology, and in other branches of science and engineering. The scientific bequest of D.I. Mendeleev, its furtherance and applications, have been emphasized thereafter at every subsequent Mendeleev Congress.

The third Mendeleev Congress was the first to be held under the Soviet regime; it took place at Petersburg in 1922. In spite of the fact that the congress was called at a time when the country was in a difficult economic situation, its convocation was opportune and the congress had a vitalizing effect in the resurgence and future development of chemistry in our country.

The fourth Mendeleev Congress was held at Moscow in September 1925. At that congress were outlined for the first time the basic trends of research that were to be followed by Soviet chemists.

The fifth congress, at Kazan' in June 1928, was dedicated to the fulfillment of the historic resolution of the Council of People's Commissars of the USSR, concerning implementation of a chemization of national economy of USSR. This resolution was adopted as a result of advocacy by a number of prominent scientists and chemical engineers, supported by a large scientific and technical community, of the necessity to take utmost advantage of modern chemistry in order to achieve an enhancement of the national economy. This congress was called on the centennial of the birth of A.M. Butlerov -- the originator of the theory of chemical structure of organic substances, at his native district. (A.M. Butlerov was born at Chistopol, in the Government of Kazan')

The sixth Mendeleev Congress took place at Khar'kov in 1932; it had a particularly large number of participants. In view of the resolution of the 17th Party Conference, concerning elimination of lagging that existed in the chemical industry, as compared with the general rate of development of national economy, this congress devoted particular attention to

deliberations on problems relating to organization of new productions and more extensive use of physical chemistry in the intensification of technological processes. The congress formulated to the chemical community the urgent problems of chemistry and chemization of the country during the second Five-Year Period, and outlined ways and means of resolving them. At that congress was also started the work of the All Union Chemical Society imeni D.I. Mendeleev, which brought together the widespread circle of chemical community and which has become the continuer of the work of the Russian Physico-Chemical Society, organized 91 years earlier on the initiative of outstanding Russian chemists -- D.I. Mendeleev, N.N. Zinin, A.M. Butlerov, P.P. Alekseyev, N.A. Menshutkin, A.A. Voskresenskiy, and others. A.N. Bakh was elected president of the new Society.

The seventh Mendeleev Congress is known as the Jubilee Congress; it was held at Leningrad in 1934 in celebration of the centennial of the birth of D.I. Mendeleev.

During the years that have elapsed since the seventh Mendeleev Congress, numerous large, special meetings and conferences on different branches of chemical science and industry have been held in our country.

The Eighth Mendeleev Congress has been called by the All Union Chemical Society imeni D.I. Mendeleev, the Academy of Sciences USSR, the Ministry of Chemical Industry USSR, jointly with the State Committee on Chemistry of the Council of Ministers USSR, and the Ministry of Higher Education USSR [2]. Arrangements for, and the meetings of the congress were directed by the Organization Committee working directly at the Presidium and the Department of Chemical Sciences of the Academy of Sciences USSR.

([Note] The Organization Committee included the following members: Academician A.N. Nesmeyanov (Chairman); N.M. Zhavoronkov, Corresponding Member, Academy of Sciences USSR (Deputy Chairman); I.P. Losev, Doctor of Technical Sciences (Deputy Chairman); Academician S.I. Vol'fkovich (Deputy Chairman); V.V. Kozlov, Doctor of Chemical Sciences (Chief Scientific Secretary); Academician A.Ye. Arbuzov; Academician B.A. Arbuzov; I.V. Belov, of the VSNITO [All Union Council of Scientific, Engineering and Technical Societies]; Academician A.I. Brodskiy, Academy of Sciences Ukrainian SSR; Academician P.P. Budnikov, Academy of Sciences Ukrainian SSR; Academician A.P. Vinogradov; Professor G.D. Vovchenko; N.N. Vorozhtsov, Corresponding Member, Academy of Sciences USSR; S.V. Gorbachev, Doctor of Chemical Sciences;

S.N. Danilov, Corresponding Member, Academy of Sciences USSR; Academician M.M. Dubinin; V.P. Yelyutin, Minister of Higher Education USSR; V.A. Ivanov, of the Central Committee of the Trade Union of Workers of the Chemical Industry; Professor V.M. Kakabadze; V.S. Kiselev, Doctor of Technical Sciences; Docent V.P. Komarov; Academician V.N. Kondrat'yev; Academician L.K. Lepin', Academy of Sciences Latvian SSR; Academician Yu.G. Mamedaliyev, Academy of Sciences Azerbaydzhan SSR; K.P. Mishchen'ko, Doctor of Chemical Sciences; B.V. Novikov, of the State Committee on Chemistry of the Council of Ministers USSR; A.N. Planovskiy, Doctor of Technical Sciences; M.A. Prokof'yev, Deputy Minister of Higher Education USSR; O.N. Reutov, Corresponding Member, Academy of Sciences USSR; Z.A. Rogovin, Doctor of Technical Sciences; A.Ya. Ryabenko, of the Gosplan USSR; Academician N.N. Semenov; Academician A.N. Terenin; S.M. Tikhomirov, Deputy Chairman of State Committee on Chemistry of the Council of Ministers USSR; Academician A.V. Topchiyev; K.V. Topchiyeva, Doctor of Chemical Sciences; N.S. Torocheshnikov, Member of the Board of the Ministry of Higher Education USSR; G.V. Uvarov, Deputy Chairman of State Committee on Chemistry of the Council of Ministers USSR; V.S. Fedorov, Chairman of State Committee on Chemistry of the Council of Ministers USSR; N.A. Figurovskiy, Doctor of Chemical Sciences; Academician A.N. Frumkin; Academician I.I. Chernyayev; Academician M.M. Shemyakin; Academician S.Yu. Yunusov, Academy of Sciences Uzbek SSR.)

A number of commissions and groups were appointed by the Organization Committee to deal with specific tasks involved in arranging the congress and setting up its agenda. A total number of approximately 500 chemists were actively engaged in organizing the congress.

The Eighth Mendeleev Congress convened on 16 March 1959, at 16 hours, in the assembly hall of Moscow State University imeni M.V. Lomonosov, at Leninskiye Gory.

Under a large portrait of D.I. Mendeleev, is the Standing Committee of the Congress, consisting of members of the Organization Committee and the section leaders. Above them is displayed the slogan of the assembly -- "We Shall Fulfill the Resolutions of the 21st Congress of Communist Party of Soviet Union, on Faster Expansion of Chemical Industry".

In the crowded assembly hall of Moscow State University are gathered the delegates to the congress, representatives of the chemical community, scheduled speakers, and numerous guests from different parts of the Soviet Union and from foreign countries. In his opening

address the chairman of the Organization Committee, Academician A.N. Nesmeyanov stated: "... The preceding, Seventh Mendeleev Congress (1934) coincided with the transfer to Moscow of the Academy of Sciences USSR which at that time had only a limited scope of activities. As concerns chemical institutes, the Academy had then only three small institutes -- the Institute of General and Inorganic Chemistry, the newly established Radium Institute, and the Institute of Organic Chemistry. By now the Academy has achieved a tremendous growth. It includes 12 chemical institutes the personnel of which, not counting the 28 chemical institutes of the Branches, and of Academies of Sciences of Union Republics, greatly exceeds that of the entire Academy of those days ...

At the present time the Soviet chemical science has, in addition, scores of large industrial scientific research institutes, hundreds of plant laboratories, and some 80 higher chemical educational establishments and chemical departments...

At every Mendeleev Congress the active participants have included the foremost scientists of our country, who directed the arrangements of the congress and took part in the presentation of papers. I shall name only some of them: N.N. Beketov, N.A. Umov, V.I. Vernadskiy, D.P. Konovalov, A.Ye. Favorskiy, N.S. Kurnakov, A.Ye. Fersman, N.D. Zelinskiy, L.A. Chugayev, V.Ye. Tishchenko, D.N. Pryanishnikov, A.N. Bakh, P.P. Lazarev, V.G. Khlopin, A.A. Baykov, S.I. Vavilov, N.A. Morozov, N.A. Shilov, V.A. Kistyakovskiy ...

In the past the Mendeleev Congress has played an important part in the consolidation of our chemical community, in drafting scientists and chemical engineers to solve the urgent problems of development of chemical science and industry. It has also been of great importance in furthering the ideas of chemization of our national economy ...

Almost a quarter of a century has elapsed between the Eighth Mendeleev Congress and the congress that preceded it. During these years the network of scientific establishments which conduct research in widely diversified branches of chemistry throughout our country has been greatly expanded and strengthened; a large chemical industry has been established which utilizes the achievements of Soviet chemical science. While in the past there were heard the voices of a few of our individually prominent scientists, the whole world can hear now the wide gamut of Soviet chemical science ...

The Eighth Mendeleev Congress which opens today, has been called at a time that is of very great

significance to our country, the time of putting into effect of the Seven Year Plan of development of national economy of the USSR, ratified by the 21st Congress of the Communist Party. Our country is entering a new, historic stage in the building of communist society. This great program inspires us chemists, as it does the entire Soviet people. We are particularly proud of the fact that the Seven Year Plan of development of national economy of the USSR provides for a huge expansion of chemistry ...

The resolutions of the May Plenum of the Central Committee of Communist Party of Soviet Union, and of the 21st Congress of Communist Party of Soviet Union, provide, according to the directive data on development of national economy during 1959-1965, for a rapid expansion of chemical industry, so as to increase its total output by approximately three times ...

Production of synthetic materials is to be increased to an especially large extent; that of synthetic fibers by 4 times, and of the most valuable of these fibers -- by 12-13 times; of plastics -- by almost 7 times. The manufacture of polymeric products is to be effected by relying upon a new base of raw materials, with wide utilization of byproduct gases of petroleum industry, and of natural gas, which will greatly reduce the costs, in particular of the production of synthetic rubber and nitrogen fertilizers ...

The vast production volume of new synthetic materials, planned for the Seven Year Period, will make it possible to meet the steadily increasing needs of the Soviet people in low-priced consumers' goods, and also to raise the technical and economic level of all branches of national economy ...

Extensive development of chemical industry will make it possible to attain the high level of agricultural production that is contemplated by the Seven Year Plan, and which requires steadily increasing amounts of fertilizers, chemical pesticides, plant growth regulators, chemicals for weed control, etc. In particular, it is planned to increase by about 3 times the output of mineral fertilizers produced by our chemical industry (from 12 million tons in 1958, to 35 million tons by 1965).

The anticipated huge expansion of chemical industry will be based on achievements of chemical science and engineering. Thus, fulfillment of the grandiose tasks of the Seven Year Plan devolves upon us, chemists, a very weighty responsibility ...

I do not doubt that Soviet chemical workers, who add up to a host the representatives of which are

gathered in this hall, will be found worthy of the trust of our great Party and of our people, and that they will embody in practice the idea of an extensive chemization of our national economy ...

I would like to mention that this idea had been nurtured and advocated by many of our prominent chemists, participants, in the past, of the Mendeleev Congress. Let me recall that on 14 March 1928 a delegation of scientists and chemical engineers, including A.N. Bakh, N.S. Kurnakov, N.D. Zelinskiy, E.V. Britske, A.Ye. Poray-Koshits, V.Ya. Kurbatov, and others, was received by the Soviet Government. The delegation submitted a report which included an offer of its active participation in an immediate putting into practice of the attainments of chemical science, with the view of effecting a rapid advancement of industry, agriculture, and public health. In response to this petition by the scientists, there was established a Committee on Chemization of National Economy of the USSR, first at the Council of People's Commissars USSR, and later at the Gosplan. In the guidance of this committee took an active part prominent chemists -- A.N. Bakh, A.Ye. Fersman, E.V. Britske, and others. The Committee on Chemization played a very important part in the establishment and development in our country of a progressive chemical science and industry, and in the expansion of higher technical education.

In May 1935 the Academy of Sciences held a special session devoted to problems of chemization of our national economy.

The magnitude of expansion of chemical industry formulated by the May Plenum of Central Committee of Communist Party of Soviet Union, and in the resolutions of 21st Congress of Communist Party of Soviet Union, greatly surpasses the most daring dreams of our predecessors. It is up to us to embody in practice this grandiose and inspiring plan.

The Eighth Mendeleev Congress is dedicated to the fundamental problems of putting into effect the resolutions of the 21st Congress of Communist Party of Soviet Union, pertaining to chemistry. These problems concern chemistry and technology of polymers, organic syntheses, chemical kinetics, radiochemistry, biochemistry and metabolic processes, photochemistry, physical chemistry, electrochemistry, agriculture of the USSR, and composite utilization of chemical raw materials.

The congress will also consider the problems of scientific and technical progress of chemical industry,

manufacture of chemical apparatus, and chemical machine building.

Questions concerning the training of personnel needed for effectuation of the vast plan of chemization of our national economy, are the subject-matter to which is devoted a special symposium on higher chemical and technical education.

The Eighth Mendeleev Congress must assess the present state of development of individual branches of chemical industry, uncover the lagging components, direct the attention of chemists to the working out of the most important theoretical and practical problems connected with effectuation of the great designs of the 21st Congress.

At this Mendeleev Congress are gathered together the delegates from every part of the Soviet Union ...

On behalf of the Organization Committee, I cordially welcome the delegates and the guests of the Congress. We note with particular gratification the presence among us of chemists from 19 foreign countries, to whom I extend a cordial welcome on behalf of the Organization Committee and of all the participants (Applause) ...

In opening the Eighth Mendeleev Congress we can not fail to recall with gratitude our predecessors, and in the first place the giant of scientific thought -- D.I. Mendeleev, who laid one of the cornerstones of all Natural Science ...

The Eighth Mendeleev Congress has assembled during the year that marks the 125th anniversary of the birth of this great son of the Russian people, and the 90th year of the Periodic Law of Chemical Elements, which has radically altered the entire aspect of modern science ...

How kindred was the idea of chemization to the heart and mind of Mendeleev. How happy he would be in sharing with us the enthusiasm that arouse the great resolutions on expansion of chemical industry and the development of our national economy.

Forward Comrades, to the fulfillment of resolutions of the 21st Congress.

Following the inaugural address of A.N. Nesmeyanov, who declared the congress in session, on a motion by the Deputy Chairman of the Organization Committee -- Professor I.P. Losev, the Congress enthusiastically elected as the Honorary Standing Committee of the Congress, the Presidium of the Central Committee of Communist Party of Soviet Union.

At the first plenary session the speakers were:

Chairman of State Committee on Chemistry of the Council of Ministers USSR, V.S. Fedorov, "The Tasks of Scientific and Technical Progress in Chemical Industry" [3], and V.A. Kargin, "Problems of the Chemistry of Polymers" [4].

The first of these papers was concerned entirely with problems of the Seven Year Plan of development of the whole chemical industry, with problems that confront some of its branches, trends of chemical science, the planning agencies, and all workers of the vast chemical front. The paper described achievements of scientific researches of Soviet chemists which provided the foundation of a number of technological processes in the chemical industry, and the attainments and prospects in some individual branches of the chemical industry.

The tasks pertaining to development of chemical industry are tremendous; but by relying upon the highly developed socialist industry, on the available large cadres of chemical scientists, workers, and experts of the chemical and allied industries, on the unlimited sources of raw materials, and availability of means necessary for the building of new chemical plants and expansion of those already in operation, our country possesses all that is prerequisite for a successful fulfillment of resolutions of the 21st Congress relative to a fast expansion of the chemical industry.

In the paper of V.A. Kargin were outlined the ways of obtaining polymers having specified characteristics and structure, which are produced by polymerization and polycondensation, and adapted to meet the various needs of modern science and industry. New polymerization techniques permit to regulate the structure of polymeric chains, and the interlinking of separate sections of molecular chains by chemical bonds results in formation of new classes of grafted and block polymers. Of interest are the methods of producing inorganic polymers, of the various polycyclic chain molecules, problems connected with utilization of polymeric substances, and with the model-studies of biological processes. In the paper were presented the fundamental propositions of general theory that correlates composition and structure of polymeric chains with properties of polymers, and which constitutes the guidance lead in successful development of chemistry and technology of polymers.

At its first session the congress was greeted on behalf of the chemists of Chinese People's Republic by Professor Yang Shih-hsien, President of the All China Chemical Society and Chairman of Scientific Council of the Ministry of Chemical Industry, Chinese People's Republic. He presented to the congress a memorable gift

-- a silk-embroidered portrait of D.I. Mendeleev.

At the subsequent plenary sessions of the congress the following papers were read:

A.N. Nesmeyanov [5] in his paper "The Periodic System of D.I. Mendeleev and Organic Chemistry", gave a description of the course of development of chemistry of organoelemental compounds, and of their practical importance. On the basis of very extensive data, there were shown in the paper the prospects of a new, rapidly growing organic chemistry of all the elements of the periodic system.

N.N. Semenov [6], in his paper "The Basic Problems of Chemical Kinetics", described the new investigations in the field of free radicals, and the significance of chain reactions in chemical, biological, and technical transformations.

V.I. Spitsyn [7] presented a paper on "Present State of the Periodic Law of D.I. Mendeleev". It showed the development of the fundamental law of natural science, its boundless potentialities, as concerns theoretical chemical investigations and practical applications. The periodic law has made it possible to ascertain the correlations between various properties of chemical elements, ranging from the melting points and boiling points of free elements and of their compounds, to the fine catalytic and radiochemical characteristics. At the present time the periodic system of D.I. Mendeleev provides a basis for the selection of components of heat-resistant materials and of high-grade alloys. By means of the periodic law are being determined the conditions of a joint occurrence of elements in nature, which facilitates prospecting for new deposits of useful minerals.

A.P. Vinogradov [8], in the paper "Basic Problems of Radiochemistry", dealt with the vast domain of transmutations and formation of new nuclei, procedures of isolation and identification of radioactive isotopes, the study of their characteristics, behavior under different physico-chemical conditions, the action of their radiations upon matter. The paper described the utilization of radiochemical advances in biological and geological research, of their applications in various branches of national economy.

V.A. Engel'gardt [9], in his paper "Basic Problems of Biochemistry", described the pivotal, crucial aspects of biochemical research. In modern biochemistry the principal attention is focussed upon study of two kinds of natural high-polymer substances -- proteins and nucleic acids. The role of the latter and, particularly, of desoxyribonucleic acid, as specific chemical substance

that effects transmission of inheritable qualities in a number of generations has been confirmed by conclusive experiments which show retention of inheritable characteristics in a number of consecutive generations. The speaker described the process of synthesis of the protein molecule, as a series of distinct, sharply delimited stages: an activation of amino acids which are to combine with one another by a formation of peptide linkages; an ordered combining of activated amino acids by completion of peptide linkages, with arrangement in a specific order; the acquiring of a spacial structure, within three-dimensional space, that is specific of a given protein. Of importance are the problems connected with study of chemical structure of protein. Here, primary attention is given to the study of such biologically active proteins, as enzymes and proteinic or polypeptide hormones, and also of biologically active pigments, chromoproteins, in particular of hemoglobin and myoglobin (the coloring matter of muscles).

The fundamental problems of biochemistry also include the question concerning connection and correlation between chemical structure and biological functions of bio-active substances. The dominant trend in the problematics of modern biochemistry, and especially in its future aims, is that trend which the speaker had previously characterized as functional biochemistry. By this is meant the endeavor to provide a biochemical, and consequently, on final analysis, an essentially chemical interpretation of nature, mechanism, and essence of definite physiological functions.

A.V. Sokolov presented a paper on "Chemical Problems of USSR Agriculture", in which he dealt with the questions concerning the participation of chemistry in agriculture and the various means of applying chemistry to farming. The main chemical problem of USSR agriculture is the production and use of mineral fertilizers; upon its solution depends the prosperity of the people [10].

V.B. Nikolayev, Director of NIIKhim mash [Scientific Research Institute of Agricultural Machinery], read a paper on "Basic Tasks of Chemical Machine Building and Apparatus Building", in which he described the specific measures that must be put into effect as a result of the directives of the 21st Congress of Communist Party of Soviet Union, concerning the outfitting of rapidly growing chemical industry with new, modern chemical equipment. In the paper were considered the present state of production of various chemical apparatus and the tasks of chemical machine building in conformance with

development trends of chemical industry as a whole. The speaker called attention to the solution of such basic problems as development of automatic designs of machines and equipment for the new types of machines and equipment for new chemical manufactures, primarily of new polymeric materials; amelioration of performance ratings of the equipment being produced, and lowering of material expenditures per unit; production of larger assemblies; changeover from batch processes to continuous operation; improved technology of manufacture of chemical equipment with putting into practice of efficient technological methods of processing of new metallic materials; wider use of non-metal materials in the building of chemical equipment; amelioration of working conditions at chemical enterprises, etc. [11].

Ya.K. Syrkin presented a paper on "Present State of the Valency Problem". The paper called attention to the specific features of the quantum mechanics theory of chemical bond, to further expansion of the theory of covalent bond, in the form of donor-acceptor propositions, on the significance of bridge bonding. The speaker considers the inadequacy of conventional notions concerning valency number of elements, particularly in the case of inorganic compounds. The paper provided an extensive description of multiple-center molecular orbits as a method of interpreting the structure of many molecules. In this method is considered jointly the combination of all bonds in the molecule; and all the electrons in the field of all nuclei are being considered. By molecular orbit is meant, in this connection, the physical state of electron in the field of all nuclei. The method of molecular orbits is highly effective and very promising [12].

A.P. Aleksandrov read a paper on "Some Chemical Aspects of Utilization of Nuclear Energy". Examples are given of direct chemical utilization of nuclear radiations as the most economical means of utilizing nuclear fuel for the production of cheap electric power. Use of radiation associated with nuclear transformations, or obtained by means of accelerators, makes it possible, without appreciable overall heating of matter, to create therein centers of excitation, ions, and free radicals, in amounts sufficient for effectuation of chemical reactions on a substantial scale. Radiation chemistry permits the preparation of products having entirely new properties, which can not be obtained, or which are difficultly obtained, by conventional means.

All the papers read at plenary sessions of the congress dealt with fundamental problems of modern

chemistry and technology, and with promising scientific problems.

([Note] The plenary sessions were held under the chairmanship of: Academician A.N. Nesneyanov; Professor I.P. Losev; Academician A.Ye. Arbuzov; Academician S.I. Vol'fkovich; N.M. Zhavoronkov, Corresponding Member, Academy of Sciences USSR; Professor V.M. Kakabadze; Academician N.N. Semenov).

The work of the sections of the congress was conducted, on 17-23 March, at the Moscow University, at different institutes of the Academy of Sciences USSR, at the Institute of Biological and Medical Chemistry of the Academy of Medical Sciences USSR, and at the Scientific Institute of Fertilizers and Insectofungicides, imeni Ya.V. Samoylov [13].

In a review that is being published in a periodical, it is not possible to consider all the papers that were presented at sections of the congress; therefore the reviewers are forced to consider only some of them, and refer those who are interested in the other papers, and in a more detailed consideration of the papers, to the 22 issues of abstracts of papers and communications read at the sections, which have been published for the participants of the congress, and to the complete texts of papers presented at plenary sessions of the congress (6 issues, published by the Academy of Sciences USSR, 1959).

Section of Inorganic Chemistry and Technology [14, 56] -- worked under the direction of Academician I.I. Chernyayev, with the deputies: Academician V.I. Spitsyn; B.V. Nekrasov, Corresponding Member, Academy of Sciences USSR; Scientific Secretary O.N. Andrianova, Candidate of Chemical Sciences.

([Note] Section Secretaries were: T.N. Dymova, Candidate of Chemical Sciences; I.D. Kolli, Candidate of Chemical Sciences; A.I. Lazarev, Candidate of Chemical Sciences; Ye.I. Ionov, and V.T. Orlova. The sessions were held under the chairmanship of: Academician I.I. Chernyayev; Academician A.A. Grinberg; Academician I.V. Tananayev; I.A. Kazarnovskiy, Corresponding Member, Academy of Sciences USSR; B.V. Nekrasov, Corresponding Member, Academy of Sciences USSR; I.N. Lepeshkov, Doctor of Chemical Sciences; A.V. Novoselova, Corresponding Member, Academy of Sciences USSR; Professor G.A. Meyerson; Professor O.Ye. Zvyagintsev)

At the first session of the section, V.I. Spitsyn presented a paper concerning the tasks of Soviet inorganic chemistry in connection with the resolutions of 21st Congress of Communist Party of Soviet Union.

Considerable interest aroused the following papers: "New Data on Polythionates" by I.V. Yanitskiy. He has evolved procedures for the preparation and isolation in the form of salts of organic cations of higher polythionic acids, which confirms the idea expressed by D.I. Mendeleev, of these acids being the derivatives of polybasic sulfur hydrogens. "Study of Chemistry of Uranates" by V.I. Spitsyn and Ye.A. Ippolitova. "On Mechanism of the Reactions of Formation of Peroxides and Their Oxidative Action" by I.A. Kazarnovskiy. "On Inclusion Compound of Beryllium Hydroxyacetate" by A.V. Novoselova, K.N. Semenko and A.I. Grigor'yev. "Investigation of Reactions of Hydroxides of Metals of Group I and II with Hydrogen Peroxide" by S.Z. Makarov.

In addition to the general sessions, the work of the section was conducted at two sub-sections, of Physico-Chemical Analysis and Chemistry of Complex Compounds.

Among the papers of the first sub-section, the following are noted: "New Investigation Methods in Thermography" by L.G. Berg. The method proposed by him for automatic recording of electric resistances, volume determinations, and viscosity, synchronously with the conventional thermal curves, increases considerably the scope of application of thermography. "Development Prospects of Physico-Chemical Analysis Applied to the Reactions of Synthesis of Inorganic Hydrides" by V.I. Mikheyeva. "The Conditions of Formation of Metastable Phases and Compounds" by N.N. Sirota. "Physico-Chemical Characteristics of the Lake Balkhash and of Sulfate Lakes of the Balkhash Area" by B.A. Beremzhanov. L.A. Borovskikh and Ya.Ye. Vil'nyanskiy, in their paper "The Physico-Chemical Foundation of Potassium Bichromate Production by the Method of Double Decomposition", have reported on investigation of the quinquartite system which is the basis of technological production of bichromate.

Among the papers presented at session of sub-section on problems of chemical technology, the following were of interest: "Intensified Processes of Hydrothermal Processing of Natural Phosphates to Fertilizers" by S.I. Vol'fkovich, N.N. Postnikov, A.A. Ionass, V.V. Illarionov and R.Ye. Remen. They have developed a new thermal process for the treatment of unconcentrated apatite-nepheline ore with steam at fusion temperature of the ore. As a result there are obtained fertilizers which contain assimilable phosphate, while the fluorine gases are removed. The same procedure is successfully used to process Kara-Tau phosphorites containing magnesium. The process is carried out in a high rate of operation

furnace of the cyclone type, yielding a product which is a concentrated fertilizer and an animal feed.

Ye.P. Ozhigov reported on a new method of processing Far Eastern boron-containing ore, with steam at high temperatures.

G.A. Meyerson, in his paper "Intensification of Some Heterogeneous Processes by Combined Action of Chemical Agents and Grinding", proposed new ways of intensifying the decomposition of wolframite, scheelite, and monazite, which are of far-reaching significance in heterogeneous reactions.

Greater efficiency and intensification of the processes for treating natural ore raw materials, to produce important chemical products and metals, have attracted the attention of many participants of this section.

V.M. Lekaye, A.G. Kasatkin and L.N. Yelkin, in their paper "Composite Processing of Sulfur Ores to Sulfur and Cement", described the continuous, automatic process which they have developed, for producing sulfur from sulfur ores, in tubular retorts, with conversion of the residue to cement.

Ye.Ya. Vil'nyanskiy, Ye.I. Savintsova, L.A. Borovskikh, A.I. Teterevkov and L.S. Bychikhina presented an interesting paper on "Regularities of the Process of Chlorination of Magnesium Oxide Suspension in a Chloride Melt".

At the sub-section of Chemistry of Complex Compounds, papers were read pertaining to different subjects: preparation and study of physico-chemical properties of various complex compounds; study of the process of complex-formation in solution; investigation of the structure of hetero-polycompounds. Several of the papers were concerned with trans-effect in complex compounds of platinum and cobalt.

Recent work on study of the trans-effect in the complex compounds of tetravalent platinum was reported in the paper by I.I. Chernyayev, L.A. Nazarova and V.S. Orlova. These authors have evolved procedures for the preparation of the previously unknown member of the pentammine series -- the platinum(IV) iodopentammine, and have studied the influence of halogens. A number of other papers were also concerned with questions of theoretical interest, relative to trans-effect and the compounds of tetravalent platinum.

Interesting data on kinetics of isotope exchange and reactions of substitution of complex compounds of platinum, palladium, and iridium, were reported by A.A. Grinberg and others.

V.G. Tronev presented a paper "On the Use of Gases at Elevated Pressure for the Synthesis of New Inorganic Compounds", in which data were reported on oxidation of sulfur, selenium, tellurium, and their compounds, under different conditions of temperature, pressure, and medium.

K.B. Yatsimirskiy presented a paper, "Thermodynamics of the Compounds of Transition Metals in the Light of the Crystal Field Theory", in which he advanced the idea that a number of peculiarities of thermodynamic characteristics of compounds which are formed by the metals of transition, can be interpreted from the standpoint of the theory of crystal fields, which had been successfully applied, in the past, in the interpretation of absorption spectra of these compounds.

An interesting paper on determination of the instability constants of complex oxalates of uranyl, magnesium, zirconium and niobium, by the method of potentiometric titration of their solution with acid, or with silver salts, was presented by B.V. Ptitsyn, D.I. Vinogradova, Ye.N. Tekster and L.N. Sheronov.

Several papers were concerned with methods of isolation of inorganic compounds, from solutions, with organic solvents, for the purpose of separation and purification of various metal salts. Thus, in the paper of Z.A. Shek and Ye.Ye. Kriss, were reported the results of the use of new organic solvents for the separation and preparation in a pure form of such rare-earth elements as lanthanum, neodymium, yttrium, and ytterbium, which is of importance in the preparation of semiconductors.

The paper by O.I. Zakharov-Nartsissov and O.Ye. Zvyagintsev was concerned with extraction of gold cyanide compounds with organic solvents. These compounds are formed on treatment of gold ore with calcium cyanide.

At the session devoted to problems of general chemistry, papers were presented on chemistry of uranates, on study of solvates of uranyl nitrite (V.I. Spitsyn, Ye.A. Ippolotova, A.P. Sokolov, V.M. Vdovenko, Ye.A. Smirnova, D.N. Suglobov). Interest was aroused by the paper of L.M. Gindin, P.I. Bobikov, E.F. Kouba, I.F. Koppa, A.M. Rozen, N.P. Ter-Oganesov and N.I. Zagarskaya, "Separation of Cobalt and Nickel by the Method of Exchange Extraction".

A new method of separation and purification of substances by a multiple-chamber, high-voltage electro-dialysis, was reported in the papers by V.A. Kargin, R.P. Lastovskiy, T.A. Matveyeva, Yu.V. Shirokiy.

The section was much interested in the papers presented by foreign scientists: "High-Polymer Phosphates in Crystalline and Vitreous State" by E. Tilo [transliterated

Russian spelling] (German Democratic Republic); "Study of Structure of Some Inorganic Compounds by Means of Radio-active Isotopes. Study of Isopolyacids", by R. Ripan and G. Mark [both transliterated] (Rumanian People's Republic); "On Research Conducted in China in the Field of Rare-Earth Elements", by Liu Ta-kang (Chinese People's Republic); "On the Relationship between Configuration and Structure of Crystal Lattice (Raney Phase) and the Catalytic Activity of Desulfurization Catalysts", by A. Simon (German Democratic Republic); "On Monomeric and Polymeric Fluor-arsenate and Fluorantimonate", by L. Koldits [transliterated] (German Democratic Republic); "Configurational Equilibrium in Solutions of Some Organic Solvents Containing  $\text{Co}^{2+}$  and  $\text{Br}^-$  Ions", by S. Mints [transliterated] (Polish People's Republic); "Properties of Elementary Bodies as a Periodic Function", by Z. Sabo [transliterated] (Hungarian People's Republic); "New Method of Determining Traces of Admixtures", by I. Noddak [transliterated] (German Federal Republic); "Technical Methods of Separation and Preparation of the Compounds of Rare-Earth Elements of the Yttrium Group", by V. Noddak [transliterated] (German Federal Republic); "Purification of Gases from Sulfur Compounds by Continuous Adsorption", by M. Gregor [transliterated] (Czechoslovak People's Republic), and the paper by the same author, on "Potassium Compounds as a Byproduct of Cement Manufacture"

The work of the section afforded an opportunity for all to become more fully familiarized with the trends of research being conducted in the field of inorganic chemistry; to learn about new methods of investigation of inorganic systems, and new processes that are to be adopted in industrial practice.

The Section of Organic Chemistry and Technology [15] worked under the direction of Academician B.A. Kazanskiy, his deputies -- P.A. Moshkin, Corresponding Member, Academy of Sciences USSR, and V.N. Belov, Doctor of Chemical Sciences, and Scientific Secretary, B.I. Stepanov, Candidate of Chemical Sciences.

([Note] In addition to the plenary sessions, the work of the section was conducted, essentially, by the following 4 sub-sections: Catalytic Reactions and Some General Problems of Organic Chemistry and Technology (Director, Academician B.A. Kazanskiy; Scientific Secretary, I.V. Gostunskaya); Chemistry and Technology of Aliphatic and Alicyclic Compounds (Director, P.A. Moshkin, Corresponding Member, Academy of Sciences USSR; Scientific Secretary, L.N. Nokhapetyan); Chemistry and Technology of Aromatic and Heterocyclic Compounds (Director, Professor Yu.K. Yur'yev; Scientific Secretary,

I.I. Grandberg); Chemistry and Technology of Organo-elemental Compounds (Director, R.Kh. Freydlina, Corresponding Member, Academy of Sciences USSR; Scientific Secretary, Ye.I. Vasil'yeva)

After the introductory address by the Section Director B.A. Kazanskiy, at the two plenary sessions papers were presented which were of interest to all organic chemists.

G.V. Uvarov presented a paper on "Prospects of Development of Organic Syntheses Industry in the USSR in the Course of the Forthcoming Seven-Year Period". The speaker described in detail the tasks of responsibility which have been assigned to workers of organic synthesis plants and to the scientists by the May Plenum of Central Committee of Communist Party of Soviet Union, and by the 21st Congress of Communist Party. He characterized the main paths of technical progress along which will take place expansion of the production of the most important organic products, in particular of the raw materials for plastics, synthetic fiber, rubber, artificial leather, and others.

Great attention was given to the paper by the well known British scientist C.K. Ingold, "Nitration at Nitrogen and Oxygen". On the basis on theoretical concepts concerning the intimate mechanism of some reactions of organic compounds the speaker derived general deductions of great interest as concerns the theory of organic chemistry, as well as to the practical performance of a number of important technological processes.

The paper by G.A. Razuvaev, "The Use of Estafette Transfer Reaction in the Study of the Mechanism of Free Radical Processes", dealt with pertinent theoretical problems of organic chemistry. By utilizing the method of "tagged atoms" G.A. Razuvaev was able to show that in a number of instances the organic reactions progress through a stage of formation of free radicals. Precise studies have demonstrated the occurrence of such an "estafette" transfer of radicals in some reactions. The method evolved by the speaker may find extensive applications in the study of the mechanism of many chemical processes.

Great interest was aroused by the paper of M.I. Kabachnik, "On Regularities of Tautomeric Equilibrium", in which a new interpretation was made of this portion of theoretical chemistry and new ways of synthetic transformations were outlined.

Interest was elicited by the paper of G. Wittig (German Federal Republic), "Problems of the Chemistry of Organic Anions".

At the first sub-section of "Catalytic Reactions and Some General Problems of Organic Chemistry and Technology", problems of stereochemistry were the subject-matter of papers by Ye.A. Shilov, I.V. Smirnov-Zamkov, G.A. Piskovitina, V.G. Ostroverkhov, D.F. Mironova, G.F. Dvorko; A.A. Akhrem and A.V. Kamernitskiy; L.D. Bergel'son and L.P. Badenkov; Ye.I. Klabunovskiy and A.A. Balandin.

([Note] At the sub-section the chairmen were: Professor D.V. Sokolovskiy; Academician Ye.A. Shilov, Academy of Sciences Ukrainian SSR; I.P. Tsukervanik, Corresponding Member, Academy of Sciences Uzbek SSR; Academician A.A. Balandin; Academician Yu. G. Mamedaliyev, Academy of Sciences Azerbaydzhan SSR; A.D. Petrov, Corresponding Member, Academy of Sciences USSR; Professor Yu.A. Gorin; Professor B.V. Tronov)

A considerable portion of the work at the sub-section was taken up by presentation of papers on catalytic hydrogenation and dehydrogenation.

Among these mention should be made of the paper by B.A. Kazanskiy, I.V. Gastunskaya and A.I. Leonova, on catalytic hydrogenation of diene hydrocarbons with an isolated system of double bonds, in the presence of platinum and palladium. The results obtained indicate that the order of addition of hydrogen to double-unsaturated compounds depends not only on their configuration, but also on the nature of the catalyst, and that the configuration of dienes can undergo a change during the process of hydrogenation.

The rearches reported by A.F. Plate and V.I. Stanko, have shown preferential hydrogenation of double bond in a five-membered ring, as against a double bond of an aliphatic chain. A number of communications on kinetics and other problems of catalytic hydrogenation and dehydrogenation were presented on behalf of A.A. Balandin and associates.

In the theory and practice of heterogeneous catalysis great potentialities are afforded by new catalysts containing varying amounts of radioactive, beta-emitter isotope. In the paper of A.A. Balandin, V.I. Spitsyn, N.P. Dobrosel'skaya and I.Ye. Mikhaylenko, was described the reaction of catalytic dehydration of cyclohexanol over sulfates of magnesium and sodium, in which sulfur was replaced by varying amounts of radioactive sulfur. In every instance there was observed an effect of the radioactive radiation on catalytic activity of the catalyst.

Extensive discussion followed the presentation of papers concerning such problems of practical importance as alkylation of paraffin hydrocarbons with

olefins, catalytic polymerization of olefins, hydration of ethylene and acetylene, chlorination of gaseous hydrocarbons, oxidation of ethylene to ethylene oxide.

Of considerable theoretical and practical interest was the communication of R.M. Flid, concerning the principle of selection of catalysts for some catalytic reactions of addition to acetylene. Of great practical importance are the catalysts developed by Yu.A. Gorin and I.K. Gorn, for the process of vapor-phase hydration of acetylene to acetaldehyde.

A paper by A.A. Balandin, M.L. Khidekel' and V.V. Patrikeyev, dealt with kinetics of hydrogenation, in the liquid phase, with potentiometric checking, in the presence of a high-activity, regeneratable, rhodium catalyst.

Mention should be made of the following papers: by Ye.G. Vol'pova and A.V. Lyuter, on catalytic polymerization of amylenes, hexylenes, and heptylenes, over a phosphoric acid catalyst; by E.M. Koganova, A.A. Vvedenskiy, T.Ye. Shakhova, A.Ye. Panitkova and A.R. Perel'man, on changes in properties of phosphoric acid catalysts during the process of hydration of ethylene; by I.M. Dolgopol'skiy, A.L. Klebanskiy and Z.A. Dobler, on complex compounds of acetylene and vinyl acetylenes with solutions, and their role in processes of polymerization and hydrochlorination; by M.Ya. Rubanik, on catalytic oxidation of ethylene to ethylene oxide; by S.V. Zavgorodniy, T.B. Gonsovskaya, L.S. Shvetsova, V.I. Sidel'nikova, V.G. Vakhtin and Ye.A. Vdovtsova, on the use of the  $\text{AlCl}_3 \cdot \text{H}_2\text{PO}_4$  complex as a catalyst of the reaction of alkylation of aromatic compounds with olefins.

In the paper of Yu.G. Mamedaliyev was described a new technological process, proposed by him, for the chlorination of saturated hydrocarbons in a "fluidized bed" of catalyst.

Of promise is the work reported by I.P. Tsukervanik, on condensation with removal of hydrogen halide, using metals in lieu of aluminum chloride. It is shown that a sufficiently fine powder of copper, molybdenum, tungsten, chromium, titanium, cerium, zirconium, or iron, can be successfully utilized in many reactions of alkylation and acylation of aromatic ring.

A number of papers were concerned with studies of catalytic properties of such catalysts as titanium dioxide, rhenium dioxide, etc., (A.A. Balandin, I.R. Konenko, A.A. Tolstopyatova, Ye.I. Karpeyskaya).

Interest of the audience was aroused by the communication of A.P. Rudenko, concerning the specific features of kinetics and the specific nature of contact substances in the pyrolysis of benzene; and by that of

A.A. Kuzmenko, on the use of hexachlorophosphoride complex in admixture with sulfur as a catalyst in the chlorination of glacial acetic acid, yielding 80% of monochloroacetic acid.

At the sessions of the sub-section of Chemistry and Technology of Aliphatic and Alicyclic Compounds, were described in a number of papers the results of researches which afford extensive possibilities in the syntheses of a large number of organic compounds. These were the following papers: by Ya.L. Gol'dfarb, on syntheses of compounds of the aliphatic series on the basis of thiophene and its homologues; by G.A. Rudakov, on the mechanisms of acidic, catalytic isomerization of unsaturated hydrocarbons; by I.Ya. Postovskiy, N.N. Vereshchagina, L.F. Trefilova and E.I. Chertkova, on the correlation between chemical structure and tuberculostatic properties of compounds; by I.A. Korshunov, N.F. Novotvorov, N.A. Pestunovich, V.N. Dubovskaya and M.R. Leonov, on the use of radioactive carbon  $C^{14}$  in the study of some industrial processes (concurrent synthesis of phenol and acetone; alkylation of benzene with divinyl, etc.); a number of papers on questions concerning the use of ketene and diketene in organic syntheses (V.V. Perekalin, K.B. Rall', G.D. Padva; Yu.V. Svetkina; N.A. Dayev, V.M. Dashunin).

([Note] Chairmen of the sub-section were: P.A. Moshkin, Corresponding Member, Academy of Sciences USSR; Professor V.N. Belov; S.N. Danilov, Corresponding Member, Academy of Sciences USSR; G.A. Razuvaev, Corresponding Member, Academy of Sciences USSR; Academician B.A. Arbuzov; Professor I.Ya. Postovskiy; Professor T.I. Temnikova; Academician Yu.G. Mamedaliyev, Academy of Sciences Azerbaydzhan SSR).

Considerable interest was aroused by the communications concerning new, promising methods of synthesis: reported by R.Ya. Levina, V.R. Skvarchenko, Yu.S. Shabarov, in connection with new methods of preparation of aromatic, cyclobutane- and cyclopropane-, hydrocarbons derived from adducts of diene synthesis; by A.L. Klebanskiy and V.F. Vosik, on synthesis of diallyl derivatives and the study of their reactivity in relation to some free radicals; by Yu.A. Zhdanov, on synthesis of C-substituted derivatives of sugars; by I.V. Machinskaya and V.A. Barkhash, on synthetic methods based on enol-acetates, which permit effectuation of alkylation under mild conditions, and to obtain products with the alkyl group in a definite position. This method might be utilized in the synthesis of natural products and their analogues, for example of pyran.

By R.Ya. Levina, V.K. Daukshas and P.A. Kaykaris, on new general methods of synthesis of dineoalkyls and di-tertiary-alkylmethanes; by N.K. Kochetkov, L.I. Kudryashev and B.P. Gottikh, on ketovinylation of compounds having an active methylene group. The investigations conducted by them expand considerably the scope of this reaction which connects many classes of compounds. From a theoretical standpoint of interest were the following papers: by S.N. Danilov, V.F. Kazimirova and A.A. Lopatenok, on redox conversions in the group of hydroxy-carbonyl compounds; by T.I. Temnikova, on chemistry of methyl-lactolides of alpha-ketoalcohols; by B.A. Arbuzov and A.I. Konovalova, who applied the spectrometric method in the study of the process of formation of adducts in the diene synthesis; by M.N. Shchukina and V.G. Yashinskiy, on the effect of spatial factors on complex-forming capacity of alpha-imino-polyacetic acids; by M.S. Malinovskiy and A.G. Yudasina, on some reactions of unsymmetrical alpha-oxides, etc.

Among the papers dealing with chemical technology, of particular interest were the following: on recovery of dibasic acids from the products of oxidations of paraffins (B.L. Moldavskiy, M.B. Blinova, V.G. Babel', R.I. Rudakova, M.Sh. Usmanova; V.K. Tsyskovskiy); on recovery of fatty alcohols from these products (P.A. Moshkin, R.I. Kobzova); on continuous oxidation of n-paraffin hydrocarbons in the form of foam (V.V. Nesmelov, N.M. Lebedeva, N.N. Terpilovskiy, O.V. Maminov, R.G. Danyushevskaya); on electro-cracking of hydrocarbon gases to acetylene (N.I. Kobozev and Ye.N. Yeregin); on preparation of a number of interesting products, dithioalkyl-(phenyl)-butadienes-1,3 from diacetylene (M.F. Shostakovskiy, A.V. Bogdanov); on investigations of the reaction of destructive nitration of ethylenic hydrocarbons and their derivatives (N.A. Nikolayeva, G.Kh. Kamay); on reactivity of unsaturated nitrocompounds (with nucleophilic reagents), by V.V. Perekalin; on preparation of chloracetaldehyde and the possibility of its use in the synthesis of various organic compounds (B.G. Yasnitskiy, Ye.B. Dol'berg, S.S. Sarkis'yants, Ts.I. Satanovskaya, A.P. Zaytsev) etc.

Of considerable practical interest is the paper by Sh.B. Aliyev and R.N. Degtyarenko, on preparation of alkyl-substituted cyclanes -- dicyclohexyl-paraffins and polycyclanes by direct condensation of cyclanes with alkyl chloroderivatives. From a technical standpoint, of interest were the papers: on hydrogenolysis of furan, by P.A. Moshkin, L.D. Pertsev, and S.F. Kalinkin; on the results of composite utilization of the process of wood

pyrolysis, with considerable expansion of the range of resultant products, by A.A. Pryanishnikov, P.D. Borisov, A.N. Vodzinskaya, I.A. Grigorov, S.O. Skvortsov, V.P. Sumarokov, I.F. Chistov; on combined method of hydrolysis of vegetable materials with concentrated sulfuric acid, and also on a combined method of acid hydrolysis and catalytic hydrogenation, carried out as a single process, with the formation of a mixture of sugars, polyhydric alcohols, etc., by S.V. Chepigo, M.Ye. Shpuntova, Ye.Ye. Shnayder, N.A. Vasyunina, G.S. Barysheva, Ye.S. Grigoryan and M.Z. Geras'kina. These communications include some valuable data concerning utilization of processes of extensive conversion of vegetable materials, and characterize thorough studies aimed at obtaining of products that are of value to the national economy.

An animated exchange of views followed presentation of the paper by V.I. Isagulyants -- on the use of cation-exchange resins as catalysts in reactions of alkylation of phenols with alcohols, dehydration of alcohols, the synthesis of high molecular esters, and reactions of ester interchange.

Among the papers dealing with new methods of synthesis of organic compounds, which were presented at the sub-section of Chemistry and Technology of Aromatic and Heterocyclic Compounds, the following are noted: by L.N. Lavrishcheva and N.M. Przhivalgovskaya, on indirect electric reduction of organic compounds, which involves the use of sodium amalgam that is formed by electrolysis in the course of the process; by N.N. Vorozhtsov, who found that some fluorine derivatives of the aromatic series can be obtained with good yields by replacement of chlorine atom by a fluorine atom in a number of aromatic chlorine derivatives, containing a sufficiently mobile halogen atom, by reacting them with anhydrous fluoride of potassium, rubidium or cesium; by A.A. Ponomarenko, on new agents in the reaction of replacement of the nitro-group by chlorine in aromatic nitro-compounds, etc.

([Note] Sessions of this sub-section were held under the chairmanship of: N.N. Vorozhtsov, Corresponding Member, Academy of Sciences USSR; Professor B.A. Poray-Koshits; Professor A.A. Spryskov; Academician A.I. Kipriyanov, Academy of Sciences Ukrainian SSR; Professor V.A. Izmail'skiy; Professor Yu.K. Yur'yev; Professor V.V. Kozlov).

Of considerable theoretical interest were the following papers: by V.A. Izmail'skiy, P.A. Solodkov, N.A. Kitras'skiy, on absorption spectra of molecular complexes formed by components of the quinoline and

acridine series; by A.A. Spryskov, on orientation of the substituents in the benzene ring (using as examples the reactions of sulfonation of a number of derivatives of benzene); by A.I. Kiprianov and A.I. Tolmachev, who have studied a new reaction for the preparation of various cyanine dyes, of symmetrical and unsymmetrical structure, containing as substituents in the polymethine chain o-hydroxyphenyl, o-hydroxynaphthyl, or o-mercaptophenyl residues; by N.S. Dokunikhin, L.M. Yegorova and G.S. Lisenkova, on radical replacement of sulfo-groups in anthraquinone sulfonic acids, in particular by nitro-groups. The reaction can serve as a preparation method, to secure specific nitro-derivatives of anthraquinone which could not be readily obtained heretofore.

A comparatively small number of papers were concerned with new facts relating to the chemistry of diazo-compounds and dyes. B.A. Poray-Koshits reported on conversions of aromatic diazo-compounds in solution, and on the possibilities of analyses of these compounds in ultraviolet light.

V.V. K zlov and B.I. Belov described as fully feasible the diazotation of various amines in an organic acid medium with dry nitrite, without the use of mineral acid. The reaction occurs with high velocity by the action of nitrosylacyl. Such diazo-compounds can be readily utilized in the reaction of replacement of the diazo-group by an acyl group, with formation of esters of aromatic hydroxy-compounds.

B.I. Stepanov has made a detailed study of the reactions of replacement of halogen in chlorine-containing hydroxyazo dyes, by O, N, S-containing substituents, and has found that the process takes place over the stage of formation of complex compounds of copper.

A number of papers were concerned with the study of the mechanisms of some conversions by the isotope method (papers by I.P. Gragerov, M.P. Ponomarchuk and M.M. Aleksankin; A.F. Rekasheva and E.P. Dar'yeva; B.A. Geller; V.V. Perekalin, T.A. Abramovich and I.P. Gragerov, and others).

Among papers of technological importance, the following communications are noted: by B.I. Kissin, D.M. Ushakov, P.K. Krutkov, on preparation of arylamine sulfonic acids in a medium of technical mixture of o- and p-dichlorobenzene (naphthionic acid, sulfanilic acid, 2,6-naphthylamine sulfonic acid, 1,2-naphthylamine sulfonic acid, etc.); by Z.I. Krutikova, Ye.M. Chernysheva and S.M. Barkov, on preparation of 2-chloroquinizarine from o-chlorophenol obtained as a byproduct in the manufacture of p-chlorophenol; by

N.K. Moshchinskaya, who synthesized a number of diaryl-methanes and polyarylmethylenes, and from them a number of plasticizing agents, resins, etc.

A special session of the sub-section was devoted to chemistry of heterocyclic compounds.

The extensive paper of Yu.N. Sheynker dealt with questions concerning tautomerism of heterocyclic compounds. On the basis of infrared and ultraviolet spectroscopy, potentiometry, and other methods, it was ascertained that tautomerism in series of heterocyclic derivatives is determined by regularities of acid-base equilibria.

Interesting data were presented in the paper (not scheduled in the agenda) of S.A. Giller, "Syntheses Based on Furfurole and Furan".

General deductions based upon extensive experimental data pertaining to study of the chemistry of hydroxy-dihydrofurans and hydroxy-phthalanes, were reported by L.A. Pavlova, E.D. Venus-Danilova and A. Fabritsy. They showed that the five-membered heterocyclic compounds of the series of 1-hydroxyphthalane and 2-hydroxy-dihydrofuran-2,5 -- have identical properties; the former as well as the latter are analogues of compounds of the series of chromenol, flavenol, and xanthohydrol. Interesting communications were presented by M.N. Shchukina and K.M. Murav'yeva, on syntheses and rearrangements in the thiazoline series, and by Yu.K. Yur'yev and K.Yu. Novitskiy, on action of alpha-oxides on 2-aminopyridine and 4-methyl-2-aminothiazole.

Kinetic studies of the reaction of acetaldehyde with ammonia (reaction of Chichibabin) were reported by M.I. Farberov, B.F. Ustavshchikov and A.M. Kut'in. Having obtained 2-methyl-5-ethylpyridine, with a good yield, and from it the 2-methyl-5-vinylpyridine, they effected on the basis of them a number of syntheses, including among them syntheses of special rubbers.

At the sub-section of Organoelemental Compounds, a number of papers and communications were concerned with chemistry of ferrocenes and organic compounds of other transition elements.

([Note] At the sessions of this sub-section the chairmen were: R.Kh. Freydlina, Corresponding Member, Academy of Sciences USSR; O.A. Reutov, Corresponding Member, Academy of Sciences USSR; Academician M.I. Kabachnik; Professor A.A. Petrov; Professor G.Kh. Kamay; D.N. Kursanov, Corresponding Member, Academy of Sciences USSR; K.A. Kocheshkov, Corresponding Member, Academy of Sciences USSR).

The general properties of derivatives of ferrocene and the regularities of its behavior in reactions of

substitution, were described in the a basic paper by A.N. Nesmeyanov and associates. Questions concerning alkylation and acylation of ferrocene and its carboxylic acids were dealt with in the communications of A.N. Nesmeyanov, O.A. Reutov, N.S. Kochetkova, N.A. Vol'kenau, and V.D. Vil'chevskaya.

Study of sydnone-3 substituted oxydiazaz(1,2,3)-lone-5, including a confirmation of the correctness of the inclusion of these substances among the aromatic compounds of non-benzene class, was reported by V.G. Yashunskiy and V.F. Vasil'yeva.

A number of papers and communications were concerned with investigation of telomerization. A basic paper on telomerization reaction was presented by R.Kh. Freydlina and A.B. Belyavskiy. On the basis of the telomerization of ethylene and tetrachlorethylene the possibility is shown of synthesizing polyhalogenated hydrocarbons containing an even number of carbon atoms in the molecule. Chemical conversion of  $\alpha, \alpha, \beta, \omega$ -tetrachloralkenes shows extensive potentialities of the synthesis of compounds of the even-number series, supplementing thereby the possibilities of syntheses involving the use of the earlier investigated reactions of telomerization of ethylene.

In the paper of A.A. Petrov and Kh.V. Bal'yan it was shown that telomerization of diene hydrocarbons with unsaturated halogen-derivatives, in the presence of chlorides of a number of metals, permits to prepare a number of terpene- and homoterpene chlorides, alcohols, aldehydes, many of which might be extensively used in industry.

Synthesis and chemical conversions of  $\alpha, \alpha, \beta, \omega$ -tetrachloralkanes were described in the papers by Ye.I. Vasil'yeva, Sh.A. Karaprtyan and N.A. Semenov (chlorocarboxylic acids), and by R.G. Petrova, V.N. Kosta, and T.T. Sidorova (alpha-amino acids).

Studies of theoretical interest were described in the papers dealing with tautomerism of organoelemental compounds (S.T. Ioffe and Yu.N. Sheynker; T.A. Mastryukova); with studies of principal classes of organometallic compound in the periodic system of D.I. Mendeleev (for lithium, zinc, cadmium, tin and lead) -- by K.A. Kocheshkov, N.I. Sheverdina, T.V. Talalayeva, Ye.M. Panov, L.V. Abramova; with hydrogen exchange reactions of alkylhalides (V.N. Setkina, D.N. Kursanov, Ye.B. Lykova); with the mechanism of the reaction of electrophilic substitution at the saturated carbon atom (I.P. Beletskaya, O.A. Reutov, R.Ye. Mardaleyshvili).

A large number of papers were concerned with the

methods of preparation and properties of new organo - elemental compounds: of zirconium and iron (E.M. Braynina); titanium and silicon (A.N. Nesmeyanov, O.V. Nogina, Yu.P. Kudryavtsev); aluminum trialkyls (L.I. Zakharkin); perfluorovinyl magnesium halides (I.L. Knunyants, R.N. Sterlin); of bismuth (A.N. Nesmeyanov, L.S. Isayeva, T.P. Tolstaya); of boron (B.M. Mikhaylov, P.M. Aronovich, A.N. Blokhina, T.K. Kozminskaya, T.V. Kostroma, N.S. Fedotov, T.A. Shchegoleva); of mercury (V.F. Velichko).

In a number of papers and communications were described the synthesis and properties of "-onium" compounds: reactions of diphenyl-bromonium, diphenyl-chloronium, triphenyl-oxonium salts (T.P. Tolstaya, A.N. Nesmeyanov, L.S. Isayeva); heterolytic decomposition of diaryliodonium and aryl-diazonium salts (L.G. Makarova); syntheses of organic compounds of tin, mercury, and bismuth, over the iodonium salts (O.A. Ptitsyna, O.A. Reutov).

A special session of the sub-section was devoted to synthesis and properties of alkyl- and alkenyl-derivatives of phosphinic and arsinous acids (papers by A.E. Shipov; T.Ya. Medved'; Ye.N. Tsvetkova; G.Kh. Kamay; V.S. Balabukh; G.K. Kozlova; Ye.A. Mironova; L.I. Tikhonova).

At sessions of all sub-sections of organic chemistry, interest was evinced in the communications of foreign scientists: of K.D. Nenitsesku [transliterated] (Rumanian People's Republic) "On the Complex of Cyclobutadiene with Silver Nitrate"; Ch. Prevot (France) on "Mesomechanism and Circular Translocation of Electron"; by G. Schott (German Democratic Republic), on "Stability and Hydrolyzability of Organosilicon Compounds"; by G. Normant and Zh. Braun [transliterated] (France), "On Vinyl Derivatives of Boron and Some Other Elements" [16].

In its resolutions the section noted that the presented papers and communications of authors representing different trends and schools of thought, show the large extent of scientific-research work, pertaining to the field of organic chemistry and technology, that is being conducted in the Republics and cities of the Soviet Union. The work of every sub-section was characterized by original trends being developed along individually distinct paths. The section called the attention of the Direction of the All Union Chemical Society imeni D.I. Mendeleev, and of the Bureau of Department of Chemical Sciences of the Academy of Sciences USSR, to the necessity of pushing work on provision of a standard nomenclature of organic compounds. The section also

considered it necessary to publish a series of monographs on methods of synthesis of organoelemental compounds, and of providing a special textbook on this particular branch of chemistry.

The Section of Analytical Chemistry [17] worked under the direction of I.P. Alimarin, Corresponding Member, Academy of Sciences USSR; of his deputy, A.I. Busev, Doctor of Chemical Sciences; and Scientific Secretaries, Z.I. Podgayskaya and G.N. Bilimovich.

([Note] At the different sessions of this section the Chairmen were: Academician A.K. Babko, Academy of Sciences Ukrainian SSR; A.K. Ruzhentseva, Doctor of Chemical Sciences; Professor V.I. Petrashen'; V.I. Kuznetsov, Doctor of Chemical Sciences; Yu.S. Lyalikov, Doctor of Chemical Sciences; A.K. Rusanov, Doctor of Physico-Mathematical Sciences; D.I. Ryabchikov, Doctor of Chemical Sciences; M.T. Kozlovskiy, Corresponding Member, Academy of Sciences Kazakh SSR; Professor V.A. Nazarenko).

In his introductory address, I.P. Alimarin stated the advances made in, and the current problems of analytical chemistry, calling particular attention to the time element of analyses, to the necessity of evolving rapid analytical procedures, the development and use of organic reagents, and to the problem of determination of traces of admixtures.

The papers presented at the section provided a wide coverage of the basic trends in analytical chemistry: the physical and physico-chemical methods of analysis; use of new organic reagents; elementary micro-analysis; chromatographic analysis; use of tagged atoms in analytical chemistry.

Theoretical problems of analytical chemistry were the subject-matter of a number of papers: I.V. Tananayev reported on the use of the procedures of physico-chemical analysis, applied to heterogeneous systems, to resolve a number of problems of analytical chemistry; K.B. Yatsimirskiy, Ye.F. Naryshkina and L.P. Rayzman described the determination of elements on the basis of catalytic reactions involving hydrogen peroxide; Yu.A. Klyachko presented a generalization of the modern methods of chemico-analytical testing for gases in metals.

Studies on stability of complex compounds, depending on structure of oxime molecule, using as examples compounds of the oximates of copper, cobalt, and nickel, were reported in the communication of V.M. Peshkova and V.M. Bochkova.

A large number of papers were concerned with the use of new organic reagents in analysis. The modern development trends of utilization of organic reagents in

inorganic analyses were reported by V.I. Kuznetsov.

For the separation of a number of elements, use was made of dialkyl- and diaryl-dithiophosphoric acids (A.I. Busev and M.I. Ivanyutin), aryl-arsonic and aryl-phosphinic acids (A.I. Portnov). New complexons were reported in the paper by R.P. Lastovskiy, Yu.I. Vaynshteyn, N.M. Dyatlova, V.Ya. Temkina and I.D. Kolpakova.

Of interest were the papers of V.A. Nazarenko and Ye.A. Biryuk; and of G.G. Shitareva, concerning the use of new derivatives of fluorone; the paper by L.I. Kononenko, on use of new derivatives of benzopyranol for photometric determination of germanium, zirconium, and hafnium; by V.K. Kuznetsova and N.A. Tananayeva, and by V.A. Obolonchik, on determination of gallium and rhenium with triphenylmethane dyes.

A paper on determination of some rare elements by the method of isotope dilution was presented by I.P. Alimarin and G.N. Bilimovich. The use of radioactive isotopes in the study of the processes of complex formation, by the chromatographic method, was reported by D.I. Ryabchikov, A.N. Yermakov, V.K. Belyayeva and N.M. Marov.

A.K. Babko showed, in the case of a number of halogenated and sulfocyanide complexes, the importance of the correlation between stability of complexes and the position of the corresponding central atoms in the periodic system of D.I. Mendeleev; V.F. Toropova reported on the dual nature of the reaction of some compounds in the course of complex-formation. The papers by Z.Kh. Shakhova, R.K. Motorkina, S.A. Gavrilova and Ye.N. Semenovskaya, and of A.I. Kokorin, jointly with N.A. Polotebneva, were concerned with the use of heteropolyacids in analytical chemistry. A large number of heteropolycompounds have been synthesized, their properties were studied, and the most promising features of their analytical utilization were ascertained.

Several papers were concerned with spectral analysis problems. In the paper by E.Ye. Vaynshteyn, Yu.I. Belyayev and V.V. Korolev, were reported the results of investigations of the influence of various factors on spatial distribution of elements in plasma of an arc; which was done with the use of radioactive isotopes. N.S. Poluektov presented a communication on formation of chemical compounds which cause the influence exercised by the composition of the solution upon intensity of radiation of elements in a flame; A.G. Karabash, Sh.I. Payzulayev and L.I. Moseyev, described the chemical concentration of admixtures in spectral analysis of pure metals.

Yu.V. Morachevskiy and I.A. Stolyarova described in their paper the new methods of analysis with the use of an ultraviolet microscope, which makes it possible to attain high sensitivity in micro-chemical determinations.

Among the papers dealing with elementary organic micro-analysis, mention should be made of the work of the late M.O. Korshun, which was reported by N.E. Gel'man. Also of the papers by N.E. Gel'man, K.I. Glazova, N.S. Sheveleva and N.I. Larina, and by V.A. Klimova, Ye.G. Bereznitskaya and Ye.N. Merkulova -- on development of rapid micro-methods for concurrent determination of several elements, using a single sample, in organic compounds of boron and of fluorine-silicon.

At the session devoted to polarography, a number of papers were presented on determination of elements by the polarographic method (S.I. Sinyakova; Z.B. Rozhdestvenskaya and I.A. Yarovoy; Ya.P. Gokhshteyn). Methods of analysis with the use of solid electrodes were described by Yu.S. Lyalikov, M.B. Bardin and Yu.S. Temyanko.

I.D. Panchenko, N.I. Udal'tsova and P.N. Paley, presented a paper on the use of the "dead-stop" titration method in the chemistry of uranium and thorium.

Considerable attention was given to chromatographic studies. M.M. Senyavin, N.K. Galkina and A.M. Sorochan showed in their paper, that it is possible to foretell a chromatographic separation of mixtures, on the basis of the position of the elements in the periodic system of D.I. Mendeleev.

The use of ion-exchange resins was the subject-matter of papers by N.G. Polyanskiy, A.S. Vernidub, and V.I. Petrashen. Gas chromatography was dealt with in the paper by A.A. Zhukhovitskiy and P.M. Turkel'taub.

At the section, interest was elicited by the communications of foreign scientists: "Quantitative Relationships in Frontal Gas-Chromatography", by G. Shay [transliterated] (Hungarian People's Republic); "On the Use of Polarography and Spectroscopy of a Number of Organometallic Compounds for Elucidation of the Nature of the Me - C Bond", by D. Semerano (Italy); "Titration in Non-Aqueous Media", by Ye. Minchevskiy [transliterated] (Polish People's Republic); "On Polarographic Method of Determination of Small Amounts of Admixtures with the Use of a Hanging Drop", by V.M. Kemulya [transliterated] (Polish People's Republic).

Liu Ta-kang (Chinese People's Republic) described the state of research on rare elements in China. On behalf of Chinese scientists he presented to the section, as a gift to Soviet chemists, a valuable collection of rare earths. M. Khristov-Kozhukharov (Bulgarian People's

Republic) presented a paper on colorimetric determination of phosphoric acid in the form of molybdenum blue, with the combined use, as reducing agents, of hydrazine sulfate and stannous chloride; I. Yenik [transliterated] (Czechoslovak People's Republic) read a paper on "Reduction Mineralization with Magnesium"; S. Stankovyanskiy and I. Charskiy [both transliterated] (Czechoslovak People's Republic) -- on "Metal Salts of Salicylidene-4-Phenylthiosemicarbazone and Salicylidene-5-Methyl-2,4-Diphenylthiosemicarbazone".

The Section of Physical Chemistry [18] worked under the direction of Academician V.N. Kondrat'yev; Deputies: V.V. Voyevodskiy, Corresponding Member, Academy of Sciences USSR; K.V. Chmutov, Corresponding Member, Academy of Sciences USSR; G.K. Bereskov, Corresponding Member, Academy of Sciences USSR; Scientific Secretary, V.Ya. Shlyapintokh, Candidate of Chemical Sciences; Secretaries, D.G. Knorre, Candidate of Chemical Sciences; V.I. Vedeneyev, Candidate of Chemical Sciences. Work of the section was conducted at three sub-sections: Kinetics of Chemical Reactions; Structure of Matter; Catalysis and Adsorption. At the plenary session of the section, V.N. Kondrat'yev presented a paper on "Physical Chemistry and Chemical Industry".

([Note] At the different sessions of this section the Chairmen were: Academician V.N. Kondrat'yev; Academician A.A. Balandin; V.V. Voyevodskiy, Corresponding Member, Academy of Sciences USSR; K.V. Chmutov, Corresponding Member, Academy of Sciences USSR; Professor A.A. Sokolov; N.M. Emanuel', Corresponding Member, Academy of Sciences USSR; G.K. Boreskov, Corresponding Member, Academy of Sciences USSR; Professor M.B. Neyman; Ya.I. Gerasimov, Corresponding Member, Academy of Sciences USSR; Professor D.N. Frank-Kamenetskiy; Professor K.P. Mishchenko; S.Z. Roginskiy, Corresponding Member, Academy of Sciences USSR.)

At the first sub-section the papers dealt with the following problems: reactions of oxidation, and reactions of free radicals; solid phase reactions, general problems of kinetics and thermal decomposition.

At the first session of the sub-section, the introductory address was delivered by V.V. Voyevodskiy. Among papers presented at the sub-section mention should be made of the following: by N.M. Emanuel', in which were set forth his views concerning the mechanism of development of malignant tumors; by M.B. Neyman, who described the kinetic, isotope method, proposed by him for determining the rate of formation and of expenditure of stable intermediate products of complex reactions.

K.K. Andreyev presented a paper concerning certain regularities of thermal decomposition of explosives.

Problems of kinetics and mechanism of oxidation of methane, the sequence of formation of stable intermediate products, were dealt with in the papers of N.N. Semenov, A.B. Nalbandyan, L.V. Karmilova, and N.S. Yenikolopyan.

Questions concerning the study of vapor-phase nitration of alkanes with nitrogen dioxide, were considered in the papers by N.B. Topchiyev, I.V. Patsevich, V.Ya. Shtern, A.P. Ballod, T.V. Fedorova, and S.I. Molchanova.

Extensive papers were concerned with the problem of combustion (Ya.B. Zel'dovich, A.S. Sokolik, L.A. Lovachev, and others).

Sessions of the sub-section on structure of matter were inaugurated by the introductory address of the section leader -- Academician V.N. Kondrat'yev.

A.N. Terenin and F.I. Vilesov presented a paper on "Photoionization and Structure of Organic Molecules", in which they reported the possibility of determining, with high precision, the energy that holds the electron in the molecules of organic substances.

M.V. Vol'kenshteyn reported on regularities on regularities of the phenomena of internal reversion and rotational isomerism, which are of considerable importance in the interpretation of the structure of crystalline high molecular substances.

P.P. Shorygin and Z.S. Yegorova described the influence of steric factors on properties of molecules with conjugated bonds. Study of the dependence of the criteria of conjugation upon turning angle of interacting groups of atoms is of great importance in the investigation of the nature of mutual influence of atoms.

Questions concerning magnetic resonance were considered in the papers by I.V. Aleksandrov and N.D. Sokolov; S.A. Al'tshuller and K.A. Valiyev; A.I. Rivkind, B.M. Kozyrev, P.G. Tishkov and V.I. Avvakumov; and by L.A. Blyumenfel'd. Problems of structure of solids were considered in the papers by S.Ya. Frenkel and S.Ye. Bresler (proteins); A.I. Kitaygorodskiy (monocrystals of organic substances); Z.V. Zvonkova (crystallochemical studies of the nature of mutual influence of atoms); V.V. Tarasov (structure of inorganic high-polymers on the basis of the method of low-temperature heat capacity); V.V. Voyevodskiy (transformation of free radicals in solids), and by others.

A special session of the sub-section was devoted to problems of thermodynamics of various systems. In their paper, A.V. Storonkin, A.G. Morachevskiy, M.P. Susarev and M.M. Shul'ts showed that they have been able

to resolve a number of important questions concerning thermodynamic theory of multiple-component heterogeneous systems. A large number of papers were concerned with questions relating to theory of solutions (M.I. Usanovich; S.S. Urazovskiy; D.S. Tsiklis; Ya.I. Tur'yan and others).

Sessions of the sub-section on catalysis and adsorption were devoted to the following subjects: problems of physical adsorption and ion-exchange; general questions of the theory of catalysis; problems of kinetics of catalytic reactions; problems of the influence of structure, methods of study of catalysts.

At the session devoted to problems of adsorption, K.V. Chmutov, Corresponding Member of the Academy of Sciences USSR, delivered the introductory address.

In a review paper, M.M. Dubinin described the results of experimental and theoretical studies of the adsorption of gases and vapor by carbon adsorbents, which led to the development of potential theory of adsorption, in which the decisive role is played by forces of dispersion. The importance of the surface nature of adsorbents (silicas, aluminosilicates, graphitic bodies) was described in their papers by V.F. Kiselev and K.G. Krasil'nikov; A.V. Kiselev; A.Ya. Korolev and K.D. Shcherbakova.

A number of papers were concerned with ion-exchange resins. At the session of the sub-section on catalysis, the introductory address was delivered by G.K. Bereskov, Corresponding Member, Academy of Sciences USSR. In an extensive paper on "Catalysis and the Periodic System of Elements", S.Z. Roginskiy explained the regularities of catalytic properties of metals as a function of their position in the periodic system, using as examples catalyses of oxidation-reduction type, and acid-base ionic catalyses.

The regularities thus ascertained indicate the very promising nature of the use of the periodic law in the selection of catalysts and the regulation of their characteristics by means of additives. The effects of the reaction system, of nature of solvents, on the surface of the catalyst, were described in the papers of G.K. Boreskov, D.V. Sokol'skiy, and others. Specific catalytic processes were described in the papers by Ya.B. Gorokhovatskiy; A.A. Balandin, V.E. Vasserberg, M.P. Maksimova, T.V. Georgiyevskaya; V.Kh. Matyushenko, A.A. To stopyatova; M.V. Polyakov, V.V. Shal, Z.Z. Vysotskiy; and others. A number of papers were concerned with studies of composition and activity of individual catalysts -- A.M. Rubinshteyn; M.T. Rusova; A.A. Slinkina and V.I. Yakerson; and others.

At this section interest was evinced in the papers by foreign scientists: by R.P. Bell (England), on "Tunnel Effect in Reactions Involving Isotopes of Hydrogen"; by S. Uinshteyn [transliterated] (United States), on "Role of Salt Effects and Ion-Pairs in Solvolysis Reactions"; by I. Morgulescu and E. Segal (Rumanian People's Republic), on "Kinetics of Dehydration of Crystal Hydrates"; by Yu. Khoritui [transliterated] (Japan), on "Mechanism of Catalytic Synthesis of Ammonia"; by Yu. Gurvits [transliterated] (Polish People's Republic), on "Deviations from Additivity of Some Physico-Chemical Quantities in the Series of Two-Component Systems"; by Kh. Zakmann [transliterated] (German Democratic Republic), "On the Behavior of Liquid-Crystalline Phases of Binary Systems"; by K. Nikolau [transliterated] (Rumanian People's Republic), G. Tom [transliterated] (German Democratic Republic), on "Electronic Paramagnetic Resonance of Platinum Catalysts on a Carrier".

In its resolution the section noted that the development of theoretical and experimental researches on topochemical reactions is somewhat lagging behind the overall level of research on chemical kinetics. New physical and physico-chemical methods are not sufficiently utilized in the study of mechanism of topochemical reactions. It is desirable to establish new laboratories and a coordination agency for research on topochemical reactions.

The Section of Colloid Chemistry [19] worked under the direction of Academician P.A. Rebinder; Deputy, N.V. Mikhaylov, Doctor of Technical Sciences; Scientific Secretary, Professor G.I. Fuks. Session of this section was inaugurated by the introductory address of P.A. Rebinder.

([Note] The different sessions of this section were held under the chairmanship of the following: Academician P.A. Rebinder; Academician N.F. Yermolenko, Academy of Sciences Belorussian SSR; Professor Ye. M. Aleksandrova; B.V. Deryagin, Corresponding Member, Academy of Sciences USSR; Professor M.Ye. Shishniashvili.)

The papers presented at the section were primarily concerned with the following problems: surface layers and thin films; adhesion; absorption and absorptive interactions; emulsions and foam; formation of colloids, stability and coagulation; physico-chemical mechanics of the processes of structure formation; semi-colloids and dispersed systems in polymers [20].

Problems of adhesion were considered in the paper by V.P. Smilga and B.V. Deryagin, on electronic concepts in the theory of adhesion; and in the paper by

N.A. Krotova and L.P. Morozova, on adhesion bonding and methods of its study. In these communications the theory of adhesion has been further advanced by a taking into account of electrostatic forces of interaction. Yu. F. Deynega, A.V. Dumanskiy, G.V. Vinogradov and I.Ye. Neymark reported in their paper the influence of the surface, and of its modification, on dielectric characteristics of some dispersed systems. The authors showed that measurement of dielectric constant and tangent of angle of loss can be a valuable method of study of change in the surface of powders and suspensions of solid particles. In the paper by V.V. Karasev and B.V. Deryagin were reported new results of measurement of the viscosity of thin, wall-adjoining layers of liquid, by means of the viscosimetric method of blow-away. G.I. Fuks reported the results of model-studies of elementary events of interaction of solid particles in solutions of electrolytes, and showed the influence on this effect of electrostatic repulsion of diffused layers, hydration of ions, and properties of the surface of particles depending upon the distance between the latter. M.S. Ostrikov described the method which he has evolved for a visual study of the development and "spontaneous mending" of fissures in a transparent material on change in load. By means of this method the author has made model studies and conducted investigations of the processes of drying and wetting of dispersed and high-molecular systems. With the problem of surface layers and thin films was also concerned the paper by S.I. Popel, on interphase tension of iron at the boundary with silicate melt, and the paper by N.V. Pertsov, on surface activity of liquid metal coatings and their effect on strength of metals.

A group of papers on adsorption and adsorptive interactions dealt with theoretical and practical aspects of this problem. Resinous varieties of coal, which are becoming important in the economy of Belorussia and of the adjoining areas, were characterized in detail in the paper by N.F. Yermolenko and Z.A. Krivchik, who described their structure and adsorption activity. A.B. Taubman and S.A. Nikitina considered the role of the kinetic factor in adsorption and wettability, and showed that in practical utilization of wetting agents in collection of dust their efficacy can be determined not so much by the surface activity under static conditions, as by the capability of rapidly forming adsorption layers at equilibrium. The question of dust collection by means of solutions of surface-active substances, was also the subject-matter of the paper by P.I. Yermilov, who studied the efficacy of solutions of polyethyleneglycol ethers of

alkyl phenols, as a function of their structure. I.Ye. Neymark described the results of his studies of influence of chemical modification of the surface of mineral sorbents on their adsorption characteristics, which clearly show the role of the chemical nature of adsorbent surface.

Several papers were concerned with theory and with the technology of dyeing of fibrous materials (P.V. Morzyanov, B.N. Mel'nikov, V.F. Androsoy, A.A. Kharkharov).

The session of the section on "Emulsion and Foam" started with the presentation of a paper by V.F. Boyko, whose studies go beyond the scope of the above-stated problem and deal with evolvement of a method of plotting the composition-state-properties diagrams of multiple-component dispersed systems. Ye.M. Aleksandrova, V.N. Tsvetkov and N.S. Razumikhina described their work on coagulation of polystyrene latices in the absence of electrolytes. The paper by A.I. Yurzhenko and R.V. Kucher was concerned with some specific features of the course of chain reactions in emulsions of hydrocarbons stabilized with surface-active emulsifying agents. A.B. Taubman and A.F. Koretskiy presented a paper on the role of structural and mechanical properties of adsorbed layers in the stabilizing action of solid emulsifiers. This research made it possible to analyze the action mechanism of solid emulsifiers and to provide substantiated ways for their selection. M.A. Kovbuz read a paper on "The Role of Emulsifying Agents as a Kinetic Factor of Oxidation of Hydrocarbons in Emulsion"; S.M. Levi described studies of structural and mechanical characteristics of gelatin and photographic emulsions, which have made it possible to derive a number of correlations which are necessary for working out a substantiated technology of coating a base with a light-sensitive emulsion. Z.Ya. Berestneva and V.A. Kargin presented a paper on the mechanism of crystallization of colloidal titanium dioxide. This work is a continuation of a series of electron microscopic studies conducted by these authors which are aimed at elucidation of the mechanism of formation of colloidal particles. B.V. Deryagin presented two papers. In the first he described new apparatus for the study of dispersed systems, or of the surface of particles, in a flow (a flow-ultramicroscope, a flow counter of condensation nuclei, etc.). These apparatus are some of the few instruments by means of which it is possible to study the kinetics of rapid changes in colloidal solutions and aerosols. In the second paper B.V. Deryagin considered the specific features of heterocoagulation, the elements of the theory of this effect, and described

model-study experiments which confirm the foundations of this theory. Yu.M. Glazman and D.N. Strazhesko presented a paper on "The Significance of Adsorption Phenomena in the Mechanism of Coagulation of Lyophobic Sols by Electrolytes", in which were described, in particular, the results of the use of a radiometric method (perfected by the authors) in the study of adsorption of ions by colloids. E.M. Natanson, in his paper on preparation and properties of concentrated sols of metals, summarized his researches, over a period of years, in this field, and described a number of practical applications of sols of metals. S.Ye. Kharin considered in his paper the applicability of thermodynamic methods for describing the stability of colloidal systems in equilibrium; using as examples rosin sols and emulsions of transformer oil. K.S. Lyalikov read a paper on the study of the process of recrystallization of polydispersed systems stabilized against aggregation. In the paper by P.M. Silin, general conclusions were derived from the theoretical and experimental investigations conducted by the author on crystallization of sucrose.

Problems of physico-chemical mechanics and of the processes of structure formation, were discussed at a joint session of the sections on colloid chemistry and chemistry of silicates. The discussion began with the paper by P.A. Rebinder, on "Basic Problems of Physico-Chemical Mechanics of Dispersed and High-Molecular Systems". In this paper were summarized the principal regularities which hold in this new subdivision of science and which have been determined by the author and his associates. Ye.Ye. Segalova described her work in the field of kinetics of crystalline structures, and on the enhancement of their strength, and showed the importance of these processes in connection with binder materials; M.P. Volarovich and I.V. Churayev reported the results of studies of physico-chemical characteristics and structure of peat by means of radioactive isotopes. In the performance of these studies the authors developed a number of original procedures which are of general interest. In the papers by N.V. Mikhaylov and Ye.Ye. Kalmykova, the physico-chemical theory of concrete was developed further, and the structure-forming role of aggregate in concrete mix was demonstrated. The colloid-chemical theory of concrete, evolved by N.V. Mikhaylov, has resulted in valuable practical deductions. O.P. Mchedlov-Petrosyan, F.A. Latyshev, A.G. Bunakov and N.A. Levchuk presented a paper on "Thermochemical Study of Vibro-Activation of Cements", in which the mechanism of hardening of cements of different composition was

considered.

The papers on semi-colloidal and dispersed systems in polymers were concerned with specific aspects of these problems, either of practical or of theoretical importance. Among these were: the paper by V.I. Yakimova, S.L. Talmud and K.P. Mishchenko, on interaction of cellulose with liquids; by A.A. Morozov and S.N. Stavrov, on results of investigations of cation-substituted specimens of Black Sea agaroid and White Sea agar; and others.

L.I. Belen'kiy, M.Ye. Kazanskaya and T.V. Bromberg reported on their work in the field of absorption spectra of dyes. P.A. Demchenko read a paper on "Lyophilic Nature and Some Problems of Directed Synthesis of Detergents", in which the correlations were considered between wetting and detergent action of surface-active substances and their structure.

Great interest was aroused at the section by the papers of foreign scientist: of Kh.R. Kroyt [transliterated] (Holland), on "Motion of Molecules", in which the relative nature of the demarcation between simple and polymer molecule, was shown; by B. Tezhak [transliterated] (Federal People's Republic of Yugoslavia), on "Three-Dimensional Models of Precipitation Systems In Statu Nascendi".

In its resolution, the section noted the satisfactory development of applied and theoretical colloid chemistry in the USSR. After noting with gratification the arising of a new branch of knowledge -- the Physico-Chemical Mechanics (P.A. Rebinder), closely allied to colloid chemistry and originating from development of the latter, the section directed the attention of the Department of Chemical Sciences of the Academy of Sciences USSR to the desirability of establishing an Institute of Physico-Chemical Mechanics. Such an institute should become a center of development of many pertinent, practical and theoretical problems, and primarily of the problem of provision of new materials having predetermined characteristics.

Section of Chemistry and Technology of Polymers [21,48-49,54] worked under the direction of Academician V.A. Kargin; Deputy Professor Z.A. Rogovin; Scientific Secretary, Yu.M. Malinskiy, Candidate of Chemical Sciences.

([Note] At the different sessions of the section the Chairmen were: Academician V.A. Kargin; Academician S.S. Medvedev; Professor Z.A. Rogovin, Professor N.N. Shorygina; Professor G.L. Slonimskiy; V.V. Korshak, Corresponding Member, Academy of Sciences USSR.)

At the first session the introductory address was delivered by the director of the section, V.A. Kargin.

In the papers that were read, a considerable amount of attention was given to the synthesis of polymers. Great interest was aroused by the following papers: of I.P. Losev and L.A. Datskevich, on synthesis and study of polyester-urethans, which are the products of interaction of di-isocyanates with high-molecular polyesters based on dicarboxylic acids and glycols. Films made from the synthesized polyester-urethans are not dissolved completely in any organic solvent; K.D. Petrov, O.K. Gosteva and V.I. Pukhova have studied the composition and properties of the products formed in the reaction of phenols with oxazolidines, which yields phenol-oxazolidine resins. Molded articles made from these resins are of interest for potential utilization in areas having a tropical climate.

K.A. Andrianov, and then A.A. Zhdanov, have synthesized and studied the structure of members of a new class of high polymers -- polyorgano-alumosiloxanes, produced from phenyl-trichlorosilane and aluminum chloride, and from ethyl-trichlorosilane and aluminum chloride; O.Ya. Fedotova, N.I. Skripchenko and I.P. Losev have made a thorough study of the reaction of primary and secondary aromatic diamines with aliphatic and aromatic di-isocyanates, yielding polymers (polyureas) which have properties that may permit their use in the making of valuable plastics, elastomers, etc.

A number of papers were concerned with study of the mechanism of formation and of the properties of grafted copolymers: G.I. Kudryavtsev, Ye.A. Vasil'yeva-Sokolova and M.A. Zharkova have investigated the processes of chemical conversion of copolymers of acrylonitrile with vinyl caprolactam and with p-amino styrene, as a result of which the copolymers are either readily colored by dyestuffs, or are converted to polymeric azo dyes. S.N. Ushakov presented a paper on a new process of spatial cross-linking of copolymers of vinyl acetate and vinyl alcohol with crotonamide and with methyl crotonamide resulting in the formation of new kinds of synthetic fiber. Interesting work on production of grafted copolymer, by combining a hydrophilic polymer of the type of starch with hydrophobic polystyrene, was reported by V.A. Kargin, P.V. Kozlov, N.A. Plate and I.I. Konoreva. In the paper by Ye.V. Kuznetsov were described the interesting properties of copolymer compounds from salts of unsaturated acids.

In the paper by S.S. Spasskiy, A.V. Tokarev, M.A. Mikhaylov, A.I. Tarasov, T.V. Molchanov and M.Ye. Mat'kov was described the copolymerization of unsaturated polyesters with vinyl monomers.

A number of papers of theoretical and practical

importance were concerned with free-radical processes in polymers and with their use to effect modification of the properties of polymeric materials. V.V. Korshak, S.L. Sosin and M.V. Chistyakova described the possibilities of utilizing the reactions of free radicals with unsaturated compounds for producing linear polymers, and the conditions and specific features of this reaction.

Extensive possibilities of modifying properties of polymers are provided by graft polymerization and the use of radioactive radiations. This was reported in the paper by M.S. Akutin, B.M. Kovarskaya, L.I. Golubenkova, K.N. Vlasova, S.P. Kalinina, N.Ya. Parlashkevich and V.N. Kotrelev. These investigations were utilized in the designing of continuous operation machines for producing new kinds of polymers. Z.N. Tarasova, M.Ya. Kaplunov, N.A. Klauzen, B.A. Dogadkin and V.L. Karpov have studied the kinetics of radiation vulcanization of some synthetic and natural rubbers. It was found that radiation vulcanizates have high thermo-mechanical stability. The radioactive plastics can be used as medicinal preparations and as pulse data units.

A large number of papers were concerned with the modification of rubbers (M.G. Zaripova, V.K. Lyubeznikov, and others), latices (Yu.L. Margolina, and others), and of vulcanization (B.A. Dogadkin, O.N. Belyatskaya, M.S. Fel'dshteyn, I.I. Eytingon; Z.N. Nudel'man, A.S. Novikov, K.F. Kaluzhenina, and others); with enhancement of the dynamic durability of rubber mixes (N.P. Zinchenko, G.N. Buyko, N.M. Arenzon, A.I. Tumanova); with studies of fluidity of polymers (V.A. Kargin, A.S. Novikov, F.A. Galil-Ogly; G.M. Bartenev, N.V. Zakharenko, F.S. Tolstukhina, and others); with aging and breakdown of polymers (A.S. Kuz'minskiy, T.G. Degteva, and others).

The new types of rubbers which have been developed, make it possible to fabricate from them durable articles without the use of fabrics as strengthening components of the system.

Considerable interest was aroused by the communications of A.A. Vansheydt and N.N. Kuznetsova, and of F.T. Shostal et al., on synthesis of ion-exchange resins.

In the papers concerned with derivatives of cellulose, Z.A. Rogovin and V.A. Derevitskaya described the methods of synthesis of new derivatives of cellulose (with amino acids) and polyuronic acids (alginic acid), and investigation of the properties of these compounds. N.V. Mikhaylov and Z.G. Serebryakova presented a paper on "Investigations of Mutual Structural Transformations of the Modifications of Natural and Regenerated Cellulose". N.N. Shorygina, A.A. Chuksanova, A.F. Semechkina and

L.L. Sergeyeva reported on nitration of lignin and study-model compounds, which permit to visualize the complex and diversified transformations of lignin.

New researches on correlations between structure and properties of synthetic fiber were described by A.B. Pakshver, L.V. Kozlov. and others.

At the section were presented a number of interesting papers concerning with general questions of the physico-chemistry of high molecular compounds.

V.I. Selikhova, G.S. Markova and V.A. Kargin have studied the processes of orientation of crystalline and amorphous polymers in the temperature range of their softening. The mechanical characteristics of isotactic polystyrene was the subject-matter of a paper by V.A. Kargin, V.A. Kabanov and I.Yu. Marchenko. V.Ye. Gul' presented a paper on the phenomenon of extra orientation of rubberlike polymers in the breaking range, and of its effect on breakdown of materials.

At the section interest was aroused by the papers of foreign scientists: of Li Sin Gi (Korean People's Democratic Republic), on "Investigation of the Fiber of Vinylon and Its Derivatives"; of P. Pigagnol (France), on "Some Properties of Fused Macromolecular Compounds".

Work of this section aroused great interest among the participants of the congress. Many of the papers, concerned with presentation of the results of theoretical studies, which further our knowledge of the structure and properties of polymers, make it possible outline ways of production of polymers, and of materials made from them, having the required technical characteristics.

The Section of Natural Compounds and Biochemistry [22] worked under the direction of Academician M.M. Shemyakin; Deputies: Academician V.N. Orekhovich, Academy of Medical Sciences USSR; N.K. Kochetkov, Corresponding Member, Academy of Medical Sciences USSR; Scientific Secretary, A.S. Khokhlov, Candidate of Chemical Sciences.

([Note] The different sessions of this section were held under the chairmanship of the following: Academician M.M. Shemyakin; Academician V.A. Engel'gardt; Academician B.A. Arbuzov; Academician A.I. Oparin; Professor N.A. Preobrazhenskiy; Professor N.N. Shorygina; N.K. Kochetkov, Corresponding Member, Academy of Medical Sciences USSR; Academician V.N. Orekhovich, Academy of Medical Sciences USSR.)

An extensive paper concerning the basic trends of development of the chemistry of natural substances was presented by M.M. Shemyakin. The papers presented at the section, and then at the two sub-sections, of Chemistry of Natural Compounds, and of Biochemistry,

encompassed a wide range of problems. Papers on chemistry and biochemistry of proteins were presented by A.I. Oparin, K.T. Poroshin, G.A. Deborin, M.S. Reznichemko, A.G. Pasynskiy, A.N. Belozerskiy, and others. Presentation of papers on study of enzymes began with the extensive communication of A.Ye. Braunshteyn, on "The Mechanism of Action of Pyridoxal Enzymes and Their Classification". Question concerning biochemistry of enzymes were dealt with in the papers of V.I. Vorob'yev, L.A. Shchukina, N.V. Orekhovich, V.B. Spirichev, Chi Chzhen-u, N.S. Gel'man, and others. An interesting paper on "Participation of Metalloenzymes in Carbon Dioxide Reduction by Plants" was presented by Ye.A. Boychenko and N.I. Zakharova. On the chemistry and biochemistry of amino acids, papers were presented by Ye.S. Chaman, V.L. Kretovich, A.A. Bundel', M.R. Frasher, N.V. Borovikova, T.Ye. Pavlovskaya, A.G. Pasynskiy, A.I. Grebennikova.

A large group of papers on investigations of the alkaloids of Central Asia included those by the following: S.Yu. Yunusov; A.S. Sadykov and O.S. Otroshchenko; Z.F. Ismailov; G.P. Sidiyakin; A.Kh. Abduazimov; N.V. Plekhanova; S.T. Akramov; P.Kh. Yuldashev. New methods of isolation, study of structure, and synthesis of alkaloids were described by N.G. Sinilova and M.Ya. Tropp; R.P. Yevstigneyeva; A.D. Kuzovkin; G.V. Lazur'yevskiy, and others. Synthetic research in the field of alkaloids was reported by N.A. Preobrazhenskiy. The study of peptides was dealt with in the papers by M.M. Botvinik, V.I. Ostoslavskaya, S.M. Avayeva; L.M. Akimova; M.A. Prokof'yev, Z.A. Shabarova, L.A. Filipovich and others. An interesting paper on "Biochemical Properties of Cellular Organisms of Plants" was presented by N.M. Sisakyan. The photochemistry of chlorophyll was discussed by A.A. Krasnovskiy and V.B. Yevstigneyev. Study of antibiotics was reported in the papers by R.M. Khomutov, M.Ya. Karpeyskiy, E.I. Budovskiy, Ye.S. Severin, N.K. Kochetkov.

At the section were also presented papers dealing with studies of natural glucosides, tannins, lignin, vitamins, lipides, steroids, nucleic acids, carbohydrates, hormones, and other types of natural compounds. An interesting paper on "Studies of the Synthesis of Vitamin A, Carotenoids and Other Terpenoids" was presented by G.I. Samokhvalov. N.N. Suvorov and co-workers described an interesting synthesis of cortisone acetate.

New equipment for countercurrent diffusion and its experimental use in the study of some antibiotics and amino acids, were described in the paper by

A.S. Khokhlov, V.M. Baykina, Chi Chan-tsin, S.M. Mamiofe, Z.T. Sinitsyna, D.M. Trakhtenberg and L.V. Cherenkova. At the section, papers were presented by foreign scientists: D. Ivanov, I. Ognyanov (Bulgarian People's Republic) and V. Kherout, M. Khorak, I. Pliva, F. Shorm [all transliterated] (Czechoslovak People's Republic), "On Structure of Hermacrone (Hermacrol)"; D. Stutsin [transliterated] (Federal People's Republic of Yugoslavia), -- "Study of Internal Viscosity of Pathological Synovial Fluids".

In its resolution the section noted the need of extensive development of scientific research of theoretical and experimental nature, pertaining to the following fields: natural polymers -- proteins, carbohydrates, nucleotides; steroids, terpenoids; alkaloids, lipides, and particularly antibiotics. The section also noted the necessity of amelioration of research methods and apparatus, of industrial manufacture of modern equipment, without which no advances are possible in the study of natural compounds.

The Section of Agricultural Chemistry and Insecto-funcicides [23] worked under the direction of Academician S.I. Vol'fkovich; Deputies, Professor F.V. Turchin, and Professor N.N. Mel'nikov; Scientific Secretaries, A.F. Grapov, and V.M. Makarevich. In opening the session of the section, S.I. Vol'fkovich described the current chemical problems concerning production of fertilizers and chemical agents for plant protection, in the light of the Seven-Year Plan and the proposed plans of development of national economy. He expressed the hope that in the future the agronomic sciences will become exact sciences, and agricultural production -- a branch of industry.

([Note] The different sessions of this section were held under the chairmanship of: Academician A.Ye. Arbuzov; Professor N.N. Mel'nikov; Academician O.K. Kedrov-Zikhman, All Union Academy of Agricultural Sciences imeni Lenin; Professor F.V. Turchin).

M.Kh. Chaylakhyan presented a paper on his studies of new growth regulators -- the gibberellines. He has investigated the active agents discovered in the secretion of Fusarium molds. The use of gibberellines is very promising as concerns forage grasses, some garden and field crops, textile plants and vegetables. The most efficient method of their application is a treatment of the foliage.

F.V. Turchin presented a paper "On the Mechanism of Biological Fixation of Nitrogen in the Root Nodules of Leguminous Plants". As a result of extensive use of the isotope method he was able to show that enzymatic

synthesis of nitrogen compounds from atmospheric nitrogen is localized at the inner surface of the specific nodular tissues of leguminous roots, and that the first product of this synthesis is ammonia which is then utilized in the plants to produce amino acids and proteins.

S.I. Vol'fkovich, in his paper on "High Concentration Complex Fertilizers", described the possibility of producing polymeric forms of prolonged-action fertilizers (metaphosphates of potassium, ammonium, and magnesium, polymeric derivatives of urea, and others), which are not leached out by rain and irrigation water, and do not combine with the soil. Some of the synthesized amido- and imido-substituted phosphoric acids were found to be fertilizers which do not combine with the soil, obviating thereby loss of nutrients.

M.Ye. Pronin, in his paper "Effect of Fertilizers on Yields of Corn and Amelioration of Its Quality", called attention to the proper, scientifically substantiated, application of fertilizers in growing of corn, which raises by many times its yield and quality.

An animated debate took place at the section, on questions concerning the use of liquid, nitrogen fertilizers and their value as compared with solid fertilizers. Production of liquid fertilizers results in savings of capital investments in building of new, nitrogen-fertilizer manufacturing enterprises, but it necessitates a changeover in outfitting of farming with storage facilities and machinery for application of liquid fertilizers. A discussion also arose in connection with questions concerning extensive use of ammonium carbonate salts and urea as fertilizers (following the papers by S.N. Ganz, I.P. Usyukin, A.F. Kalinkovich), and the loss of nitrogen in fertilizers worked into the soil (following the paper by D.M. Guseynov).

V.V. Illarionov described the results of studies of correlation between structure of calcium phosphates and their fertilizer action. L.Ye. Berlin presented a paper on processing of different kinds of boron ore to boron-containing fertilizers, including some of a composite nature.

A special session was devoted to the use of minor element fertilizers. Papers were presented by O.K. Kedrov-Zikhman, on "Use of Molybdenum in the Non-Chernozem Belt of the USSR"; by A.V. Peterburgskiy, on "Molybdenum as Minor Element Fertilizer for Clover in Acid Soils"; by P.A. Vlasyuk, on "The Significance and Nature of Bonding of Manganese Minor Element Fertilizer in Plants", and by others. M.V. Katalymov described promising kinds of minor element fertilizers.

Ya.G. Barkan presented a paper on efficacy of gypsum application and deep mellowing of mixed solonetz soils of the Altayskiy Kray; A.M. Grinchenko described the efficacy of gypsum application in different soils of the Ukraine; M.M. Mazayeva described the action of gibberellines on clover and alfalfa; A.K. Krupskiy -- the liming of light, sandy soils; and I.V. Mosolov and L.P. Volleydt -- the role of sulfur in nutrition of plants.

B.A. Arbuzov reported the results of the work of the Chemical Institute of the Kazan Branch of the Academy of Sciences USSR, on finding and developing new, effective organophosphorus and organoarsenic insecticides. He proposed that a special plant section be built for the production of experimental batches of new insecto-fungicides that are to be used in field tests. N.N. Mel'nikov described numerous new syntheses of organophosphorus insecticides. He presented new view concerning the mechanism of action of organophosphorus insecticides on insects. He also described the results of studies of a new method of synthesizing esters of dithiophosphoric and dithio-pyrophosphoric acid, which are of interest for trials not only as insecticides, but also as herbicides and defoliating agents. A number of papers were concerned with results of studies of new herbicides for the control of weeds in corn fields (2-chlor-4,6-bisethylamin-5-triazine), new herbicides for leguminous crops (aryloxy-gamma-butyric acids), and with the study of new insecticides recommended for control of cotton weevil and many pests that inhabit the soil. Work has been conducted in collaboration on synthesis of some new insecticides by interaction of hexachlorocyclopentadiene with various unsaturated cyclic compounds (L.G. Vol'fson, N.N. Mel'nikov, A.F. Plate, and others).

In addition to the papers scheduled in the published agenda, the following papers were presented at the section: by M.S. Malinovskiy, "On Some New Organic Compounds Containing Both Phosphorus and Mercury"; by N.A. Mandel'baum, on "New Method of Synthesis of Dialkyl-, Trialkyl-, Alkylaryl-, and Dialkylaryl-Dithiophosphates"; by A.Ye. Kretov, on "Synthesis and Biological Activity of N-Phenyl-Maleinimides"; by A.F. Grapov, "On Interaction of Aryldiazonium Salts with Dialkyl-Dithiophosphates"; by A.V. Molchanov, on "On Preparation of Hexachloran and Lindane Highly Enriched with the Gamma-Isomer".

In its resolution, the section called the attention of the Academy of Sciences USSR and of the All Union Academy of Agricultural Sciences imeni V.I. Lenin, to the necessity of intensifying work on biochemistry and

and physiology of noxious pests, causative agents of diseases, and weeds. The section called the attention of the Ministry of Agriculture USSR, and the State Committee on Chemistry of the Council of Ministers USSR, to the necessity of taking steps for speeding up the testing and adoption in agricultural practice of new preparations. The section also deems it appropriate to recommend to the Ministry of Agriculture USSR the establishment of agro-chemical laboratories at the large farming installations, for the purpose of conducting studies on plant nutrition, efficacy of application of fertilizers, plant protection agents, and on other problems.

The Section of Chemistry and Chemical Technology of Fuel [24] worked under the direction of N.I. Shuykin, Corresponding Member, Academy of Sciences USSR; Deputy, N.M. Karavayev, Corresponding Member, Academy of Sciences USSR; Scientific Secretary, M.A. Ryashentseva.

The section conducted its work at two divisions: Petroleum Chemistry and Chemistry of Coal.

([Note] The different sessions of the section were held under the chairmanship of: N.I. Shuykin, Corresponding Member, Academy of Sciences USSR; N.M. Karavayev, Corresponding Member, Academy of Sciences USSR; N.V. Lavrov, Doctor of Chemical Sciences; N.G. Titov, Doctor of Chemical Sciences; A.D. Petrov, Corresponding Member Academy of Sciences USSR; S.I. Khromov, Candidate of Chemical Sciences; Professor A.F. Plate; S.R. Sergiyenko, Doctor of Chemical Sciences; Professor N.I. Chernozhukov; V.P. Sukhanov, Candidate of Technical Sciences).

Following the introductory address by the section leader, N.I. Shuykin, an extensive paper, "The Course of Development of Petroleum Processing Industry in the USSR", was presented by V.P. Sukhanov. The paper discussed not only the problems of production of high grade fuels and oils, but also the recovery from petroleum of starting materials for the synthesis of polymers, production of rubber, and synthetic fibers. N.M. Karavayev discussed from the same standpoint the efficient ways of utilizing solid fuel. In the paper by N.V. Lavrov, "Development Prospects of Production and Utilization of Combustible Gases", were shown the tremendous potentialities afforded to industrial organic syntheses by the processing of these gases to chemical raw materials, particularly for the production of acetylene, ethylene, and other most valuable products.

A number of papers (N.I. Shuykin, N.G. Bekauri) were concerned with reactions of catalytic isomerization of hydrocarbons of the paraffin series, which result in substantial amelioration of automotive fuel and, on the

other hand, also in the production of very valuable starting materials for the synthesis of rubbers and other polymers.

At the section, papers were presented on synthesis of new hydrocarbons occurring as components of petroleum, and the study of their properties and specific characteristics, which is of great value in conducting more thorough investigations of the composition of petroleum and its fractions (A.F. Plate, S.R. Sergiyenko, A.D. Petrov, and others).

Of great practical value are the results of research on synthesis of valuable additives to lubricants and fuel, which were described by V.I. Isagulyants, and on oxidability of oils, reported by I. Van-Risselberg (Belgium).

Interesting papers were also presented by G.N. Maslyanskiy, V.A. Kobelev, N.R. Bursian and M.I. Ryskin, on "Catalytic Isomerization of n-Paraffin Hydrocarbons"; A.S. Fomina, L.Ya. Pobul' and Z.A. Degtyareva, on "Chemical Nature of Kerogen of Bituminous Cookersite-Shale of the Altay-Adjoining Area and a New Way of Utilizing It"; A.A. Kruglikov, "On Isolation and Use of Dihydric Phenols of Low-Temperature Carbonization and Hydrogenation of Cheremkhov Coal"; M.A. Menkovskiy, A.N. Aleksandrova, K.Yu. Volkov, S.A. Gordon, L.V. Petrovskaya, on "Germanium and the Rare and Scattered Elements in Coal"; V.M. Ratynskiy, T.I. Sendul'skaya, "On Distribution and Nature of Germanium Compounds in Coal", and others.

Great interest was aroused by the following papers: N.I. Shuykin and T.I. Naryshkina, "Dehydrogenation of Pentamethylene Hydrocarbons in the Presence of Platinized Carbon"; I.M. Artyukhov, "New Method of Conversion of Hydrocarbons with the Use of Iron as Oxygen-Transfer Agent"; D.I. Zul'fugarly, "Minor Elements of Azerbaydzhan Petroleum"; B.A. Kazanskiy, S.I. Khromov, Ye.S. Balenkova and N.A. Seidova, "Catalytic Conversion of 1,1-Disubstituted Hydrocarbons of the Cyclohexane Series".

In many of the papers were discussed the crucial problems of the chemistry and technology of combustible gases, petroleum, coal, and bituminous shale.

In addition to the papers scheduled in the agenda the following papers were presented at the section: Al.A. Petrov, "Crystallization Temperature Regularities of Monomolecular  $C_{12}$ - $C_{16}$  Alkanes"; S.V. Adel'son, T.Kh. Melik-Akhnazarov, I.I. Mukhin, D.I. Orochko, N.A. Chepurov, "On Stepwise Countercurrent Catalytic Cracking"; V.N. Kozlov, "Wood Charcoal as Fuel and Reducing Agent for Ferrous and Non-Ferrous Metals and as Raw Material for

Polymers".

In the work of the section took part 16 foreign scientists from 6 countries. In addition to the previously mentioned I. Van-Risselberg, papers were presented by: Li Kuang-nien (Chinese People's Republic), on work carried out jointly with M.G. Gonikberg, "Homogeneous Dimethylation of Cresols"; D.D. Rushev (Bulgarian People's Republic), "On Sintering of Coal".

The Section of Chemistry and Technology of Food Products [25] worked under the direction of Academician A.I. Oparin; Deputies: Professor V.N. Bukin; Professor N.S. Drozdov; Scientific Secretary, A.A. Dmitrovskiy, Candidate of Chemical Sciences.

([Note] The different sessions of this section were held under the chairmanship of: Professor V.L. Kretovich; Professor B.A. Rubin; Professor N.S. Drozdov; Professor R.V. Feniksova; Professor M.A. Bokuchava; Professor V.V. Fremel'.)

In his paper on "Scientific Problems of the Food Industry" A.I. Oparin emphasized the most important problems, the solution of which will contribute to a successful fulfillment of the tasks involved in the Seven Year Plan of development of the food industry. In a number of branches of the industry, especially those which have to do with processes of fermentation, the biochemical investigations must be conducted in conjunction with microbiological studies. The present state of physiology of nutrition necessitates a new approach to the evaluation of food products. Evaluation of quality of nutrition products becomes of primary importance. As concerns proteins, for example, the science of nutrition has reached the point where rating on the basis of total protein is being replaced by rating based on the irreplaceable amino acids; this makes it necessary to study more thoroughly the amino acid composition of food products. Important changes have occurred in the concepts concerning the relative value of different fats. In comparison with vegetable fats, animal fats are low in irreplaceable fatty acids -- linoleic and linolenic, which are not synthesized by the animal organism, although the latter requires them. On the other hand, animal fats contain a relatively large amount of cholesterol which predisposes to development of sclerotic changes. Hence, there are weighty reasons for increasing the proportion of vegetable fats in foods.

Extensive research must be undertaken in the margarine industry, to develop selective methods of hydrogenation, and also to enrich margarine with lecithin, deficient vitamins, aromatic substances, etc. It is

necessary to solve on a wider scope, and more rapidly, the problem of increasing the vitamin content of food products, and to ensure preservation of vitamins in the finished products.

The mineral composition of food products, in particular the content of minor elements, is of very great importance in the assessment of their nutritional value, yet this question has been investigated to an entirely insufficient extent in our country.

It is necessary to find means for slowing down the biochemical processes at ordinary temperature. In this connection the use of gamma-radiation appears very promising. It is necessary to develop a suitable and wide scale production and utilization of enzymic preparations, their manufacture in concentrated form from cheap sources of raw material. The use of these valuable preparations makes it possible to intensify manufacturing processes, reduce expenditures of valuable raw materials of food, raise quality of production, and develop new kinds of products for technical, nutritional, and medicinal purposes.

All the papers presented at the section were arranged in accordance with the following subjects: grain and the products of its processing; succulent raw materials; animal raw materials and fats; enzymes and vitamins; condiments; wine, tea, tobacco; products of fermentation.

G.A. Kaptyushina presented comparative data on biochemical and technological characteristics of new varieties of wheat of Kazakhstan. On the basis of the results of this work, the 7 most promising varieties of wheat have been selected for growing. The results of work conducted on the problem of "Chemical Nature and Formation of Aromatic Components of Bread", were reported by R.R. Tokareva and V.L. Kretovich. These authors have proposed enzymatic preparations for improving the gustatory and aromatic characteristics of bread.

A.A. Kolesnik presented a communication on the intratissular atmosphere and its changes during storage of fruit and vegetables. It was ascertained, as a new fact, that fruit and vegetables not only emit carbon dioxide into the surrounding atmosphere, but also draw it into their tissues from the ambient atmosphere. In this connection the question arises of a revision of the ventilation arrangements of fruit and vegetable storage.

P.F. D'yachenko described the results of work on composite processing of milk with utilization of all of its valuable components. The newly developed processing procedure is based on a combination of

continuous operation, line-production methods for obtaining butter, edible proteins, and lactose from whey.

Great interest was aroused by the paper of I.I. Lapshin, concerning a new technological process of hot smoking of fish. The new procedure of smoking consists in treating the fish with a curing liquid followed by baking with infrared rays. The satisfactory results of these studies have made it possible to initiate the adoption of the new smoking process in the fish industry.

A considerable portion of the work at the section was devoted to the problem of vitamins. A number of papers were presented which were concerned with the result of research on development of preparation methods, of most efficient procedures of incorporation of vitamins in food products, and on preservation of activity of natural and synthetic vitamins in stored products.

Papers which summarized the present state and future prospects of vitamin research were presented by V.N. Bukin, "Natural Vitamin Resources and Ways of Better Utilizing Them", and by P.I. Kalugin, "The Role of Synthetic Vitamins in Enhancement of the Value of Food Products". Interesting papers on chemical and technologic problems of the fermentation industry were presented by M.A. Gerasimov, G.I. Beridze, I.A. Yegorov, V.V. Fremel', and others.

Questions concerning the chemistry and technology of tea and tobacco were the subject-matter of 12 papers.

M.A. Bokucheva, in a paper on "Biochemical Basis of Tea Production", described a new technology of tea production, which improves considerably taste and aroma of tea. The most recent advances in tea technology were also described in the paper by I.A. Khocholava.

The practical results attained in the changeover of the production of organic solvents (acetone, butyl and ethyl alcohol) from edible to non-edible raw materials were described by B.M. Nakhmanovich. In the production of these solvents by fermentation, it is proposed to replace up to 50% of the flour by pectose hydrolysates produced from corn cobs.

In its resolution, the section noted that in recent years the role of technical biochemistry in the improvement of industrial food technology has increased considerably due to extensive utilization in biochemical research of the latest advances of physics, chemistry, and other allied sciences.

The Section of Chemistry and Technology of Silicates [26,57] worked under the direction of Academician P.P. Budnikov, Academy of Sciences USSR; Deputies: Academician N.A. Toropov, Academy of Civil Engineering

and Architecture; O.P. Mchedlov-Petrosyan, Corresponding Member, Academy of Sciences Ukrainian SSR; Scientific Secretary, I.V. Kravchenko, Candidate of Technical Sciences.

([Note] The Section Secretaries were: A.Ye. Rempel, N.V. Petrovykh, and V.V. Myshlyayeva. The different sessions of this section were held under the chairmanship of: Academician P.P. Budnikov, Academy of Sciences Ukrainian [sic] SSR; Academician N.A. Toropov, Academy of Civil Engineering and Architecture; Professor Yu.M. Butt; Professor V.V. Stol'nikov; Professor I.I. Kitaygorodskiy; Professor I.F. Ponomarev; Docent S.M. Royak.)

In his introductory address, with which the work of the section began, P.P. Budnikov described the stages of development of the industry of silicates in the USSR, its main problems and tasks. He called attention to the necessity of furthering theoretical work on physical chemistry of silicates, including the process of sintering during firing of the materials; on investigation of multi-component systems, physical properties of liquid phase, and particularly of its structure; on study of processes of recrystallization; on physico-chemical mechanics of clays and their hydrophylic nature; on the theory of formation of clinker, its mineralogical composition, and structure. Much attention should be given to experimental studies of structure formation in the cement-water system; to determination of structure of cement stone and the mechanism of its formation. It is indispensable to carry out thermodynamic studies of the processes of hydration of binders under ordinary and under hydrothermal conditions. It is of importance to investigate the kinetics of dissolution and supersaturation of liquid phase, and of the crystallization of all hydrates that are formed on hardening. It is necessary to make a study of the mechanism and dynamics of coalescence of crystal-hydrates of cement, and of the effect upon these processes of various additives. The theoretical views concerning the role of aluminates in the hardening of cement should be re-examined.

Theoretical studies of the different methods of treatment of mortars and concrete, and also of their placing and settling, should yield information as to how the hardening of concrete can be accelerated in such a manner that a specified strength is attained within a minimum length of time. Further studies are needed for the evolvement of a general theory of structure of vitreous substances.

At the meeting of the section, Yu.M. Butt reviewed the work of D.I. Mendeleyev on binder materials. I.I. Kitaygorodskiy described the problems which confront the

scientists engaged in the study of glass. These problems are: study of the structure of different kinds of glass; further work on thermal-physics of glass making, on the shaping of glass, on treatment of surfaces of glass articles; and research on development of glass-and-plastic combinations. He pointed out the necessity of extensive collaboration with physicists in order to solve the problems of glass technology.

The papers presented at the section were grouped according to the following subjects: general chemistry of silicates; chemistry and technology of ceramics and refractories; binders and glass.

Considerable interest was aroused by the following papers: "Physico-Chemical Characteristics of Vitreous Silicates and Alumosilicates of Lithium", by S.K. Dubrovo and Yu.A. Shmidt. The rate and nature of breakdown of lithium-alumosilicate glasses, by the action of alkalis, are determined by the  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ratio. The discovery of this correlation has made it possible to develop a number of acid-resistant, thermostable glasses. In the paper on "Electrical Properties of Alumosilicates", by V.A. Ioffe, was reported the newly discovered phenomenon of resonance absorption in the radio-frequency range, of alumosilicates; M.K. Gal'perina, in her paper "On Mechanism of Origination of Clay Suspensions", reported an original method of investigation; V.I. Minenko and S.M. Petrova presented a paper on "Electrochemical Investigations of Silicate-Systems in Substantial Support of Chemical Theory of Structure of Silicate Melts and Glasses"; P.P. Budnikova and V.G. Savel'yeva read a paper on "Monoaluminate of Barium as a Binder in Refractory Concrete", which made it possible to develop new varieties of concrete for use at high temperatures. Such concrete with a barium aluminate binder shows less shrinkage and alteration of its properties on heating. "Study of the Processes of Hydration by Means of a Micro Motion Picture Unit", by O.M. Astreyeva, V.I. Guseva and N.S. Popov; "On Adoption of Oxygen Blast in Firing in Automatic Shaft Furnaces and Changeover of Their Operation with Gaseous Fuel", by N.S. Zavgorodniy; "New Kind of Alunite-Base Binder", by K.S. Kutateladze and N.G. Dzhincharadze; "Composition and Stability of Calcium Hydrosulfoaluminate Formed in Cement Stone", by I.V. Kravchenko.

An interesting paper was presented by Ye.V. Podushko, on a "New Method of Electric Welding of Glass and Fusion of Silicates with High-Frequency Currents". The work of L.N. Rashkevich and Yu.M. Butt on "Mechanism of Binder Formation on Autoclave Treatment of Calcareous-Sand Products", makes it possible to select,

in practice, a ratio of components which yield products having specified properties. V.F. Fedoryakin reported on the work of Yuzhgiprotsement Institute, jointly with the Belgorod plant, on production of brand "800" cement, and also on making of high grade, fast hardening portland cement, etc.

An animated discussion arose at the section in connection with the question concerning predominance of processes of dissolution under the conditions of preparation of hydrothermal products, over the processes of hydration in the solid phase.

At the section were presented interesting papers by foreign scientists: "On New Methods of Testing the Surface Structure of Glass" (thermo-gravitational analysis), by G. Korani [transliterated] (Hungarian People's Republic); and by E. Tilo [transliterated] (German Democratic Republic), concerning the role of protective surface layer in the breakdown of silicate glass.

The section noted that during the forthcoming years the first-priority researches in chemistry and technology of silicates should be thorough investigation of equilibrium and non-equilibrium, multiple component systems of silicate technology, and derivation of composition - property diagrams for different properties, concurrently by various methods; thermodynamic studies of silicate systems, chemical processes therein, and of phase transitions; kinetic studies of the processes of silicate technology under different energy conditions of the systems; investigations of electric properties of silicate substances and materials, particularly at high temperatures and high frequencies; investigation of the structure of crystalline and vitreous silicate, and other similar inorganic substances and materials, with the use of different methods, including roentgenography, electronography, radioactive isotopes, etc.; widening of the range of elements utilized in silicate technology; development of binders of superior quality, and of new binders, which make it possible to reduce cost of building, accelerate its rate of speed, increase strength of concrete and its stability under conditions of exposure to the action of atmosphere, water, chemical and temperature factors; development of ceramic materials having improved properties, which make possible to reduce cost of ceramic articles and ameliorate their performance characteristics under diverse conditions of their use; provision of new varieties of glass, having improved properties, for use in the new domains of modern engineering involving the action of high temperatures, of high strength electric fields of high and superhigh

frequencies; amelioration and development of refractories necessary for efficient utilization of nuclear energy, in special metallurgy, in rocket engineering, and for other purposes; further development of chemistry and technology of stone casting; thorough physico-chemical study and improvement of manufacturing processes of silicate technology with the view of attaining a substantially higher productivity of labor, better quality of production, and better working conditions.

The Section of Radiochemistry and Chemistry of Isotopes [27] worked under the direction of Academician A.P. Vinogradov; Deputy, Academician A.I. Brodskiy, Academy of Sciences Ukrainian SSR; Scientific Secretaries, A.N. Yermakov, Candidate of Chemical Sciences; G.A. Nekrasova, Candidate of Chemical Sciences.

([Note] The different sessions of this section were held under the chairmanship of: Academician A.P. Vinogradov; I.Ye. Starik, Corresponding Member, Academy of Sciences USSR; Academician V.I. Spitsyn; Academician S.S. Medvedev; Academician A.I. Brodskiy, Academy of Sciences Ukrainian SSR; N.M. Zhavoronkov, Corresponding Member, Academy of Sciences USSR.)

In his introductory address, A.P. Vinogradov noted that in connection with increasing utilization of atomic energy for peaceful purposes, the radiochemical researches are becoming steadily of greater importance, and he made reference to the important and promising problems in this field.

The first session of the section was devoted to chemistry of radioactive elements -- francium, neptunium, americium and curium (papers by A.K. Lavrukhina, S.S. Rodin, A.A. Pozdnyakov; I.P. Alimarin, Yu.A. Zolotov, Yu.P. Novikov, P.N. Paley, Ye.S. Pal'shin; G.N. Yakovlev).

A paper on systematics of half-lives of isotopes and the discovery of new radioactive isotopes of bromine, yttrium, rhodium, antimony, and of other chemical elements was presented by I.P. Semenov.

Great interest was aroused by the papers of G.N. Flerov and A. Giorso [transliterated] (United States), on the preparation of a new artificial element which occupies position 102 of the periodic table of I.D. Mendeleev. Soviet and American researchers obtained coinciding data concerning the existence of element "one hundred and two", having a half-life of three seconds.

A large number of papers were concerned with the behavior of radioactive isotopes in different processes. The results of experimental studies of the complexes of transuranium elements, formed in aqueous solutions of

different acids, were described in the paper of A.D. Gel'man, which elicited a considerable discussion. A number of complex compounds of plutonium and neptunium were isolated for the first time in crystalline form. The isolation of some transuranium elements was described in the papers by Yu.B. Gerlit, V.M. Vdovenko, M.P. Koval'skaya, T.V. Kovaleva, A.A. Lipovskiy, M.G. Kuzina, L.N. Lazarev. The isolated preparations of technetium were shown to the audience.

Questions concerning theory and practice of the separation of transuranium elements by ion-exchange, complexing chromatography were discussed in the papers by S.Yu. Yelovich, B.K. Preobrazhenskiy, A.V. Kalyamin, O.M. Lilova.

The state of micro-amounts of radioactive elements in solution was the subject-matter of papers by: I.Ye. Starik, V.I. Grebenshchikova, R.V. Bryzgalova, N.B. Chernyavskaya, V.I. Bobrova; K.B. Zaborenko, I.V. Kolosov, V.V. Fomin. Some regularities of the reactions of atoms formed after different kinds of nuclear transformations of the so-called "hot" atoms, were described in the papers by An.N. Nesmeyanov, Ye.A. Borisov, I. Zvara; B.G. Dzantiyev, B.A. Kuznetsov, A.D. Maliyevskiy. Questions concerning radiation chemistry were considered in papers on radiolysis of water and radiation transformations of oxygen-containing anions in aqueous solutions, by: Ts.I. Zal'kind, N.B. Miller, G.S. Tyurikov, G.Z. Gochaliyev, V.I. Veselovskiy; N.A. Bakh, L.G. Bugayenko, V.I. Medvedovskiy, A.A. Revina. The results of studies of regularities and mechanism of radiolysis of individual hydrocarbons of paraffin series, in liquid and solid phase, by the action of gamma-radiation of  $\text{Co}^{60}$ , were described in the paper by L.S. Polak, A.V. Topchiyev, N.Ya. Chernyak. Some regularities of the kinetics and mechanism of radiation-chemical reactions were described by S.Ya. Pshezhetskiy; the selective nature of chemical action of nuclear radiations -- by M.A. Proskurnik. Problems of isotope exchange were dealt with in a number of papers. Ye.A. Shilov and F.M. Vaynshteyn reported definite regularities in isotope effect of the reaction of iodizing of aromatic amino-compounds; L.L. Strizhak made a study of isotope exchange of nitrogen between ammonia and a number of aliphatic and aromatic amino-compounds.

A.I. Brodskiy and co-workers, characterized the mechanisms of a number of the most important reactions of technological production of hydrogen peroxide and of the inorganic per-acids, which were studied by means of the heavy isotope of oxygen  $\text{O}^{18}$ . The paper aroused great interest.

Interest was elicited by the communication of S. Thompson (United States) concerning discovery of triple fission of californium-252.

K.I. Sakodynskiy, S.I. Bobkov, N.M. Zhavoronkov, have studied the equilibrium of the reaction of exchange of hydrogen isotopes between water and thiols  $C_4-C_6$ : normal butylthiol, secondary butylthiol, iso-amylthiol, normal hexylthiol and thiophene.

In the paper by A.A. Balandin, V.I. Spitsyn, L.I. Barkova and V.I. Duzhenkov, was described the radiation method of preparation of platinum catalyst. The paper by Yu.S. Lazurkin and M.A. Makul'skiy was concerned with the kinetic effects in irradiated polymers.

Separation of stable isotopes -- of boron, nitrogen and oxygen -- was described in the paper by N.N. Sevryugova, O.V. Uvarov, S.I. Babkov, G.N. Chernykh, V.A. Sokol'skiy and N.M. Zhavoronkov. New, interesting data were cited by I.B. Rabinovich, in his communication concerning the effect of substitution of hydrogen by deuterium, on thermodynamic properties of liquids. Questions of theoretical interest concerning radiation chemistry were considered in the papers by: N.N. Tunitskiy, M.V. Gur'yev, M.V. Tikhomirov (study of the mechanism of dissociation of large molecules on electronic impact); V.L. Tal'roze, Ye.L. Frankevich (on pulse method of measurement of cross sections of ion-molecular elementary reactions).

A paper not scheduled in the agenda was presented at the section by I.P. Selinov, "On Unification of the Scale of Atomic Weights and on the Table of Atomic Weights for 1959". The participants of the congress were supplied with some data concerning this question and they were requested to state their view as to which of the scales of atomic weights they consider the best. In the work of the section took part 17 scientists from the United States, Hungary, German Democratic Republic, Poland, India, Rumania and England.

In addition to the papers scheduled in the agenda, there were presented at the section some further communications: N.N. Krot, A.G. Kozlov, "Spectrometric Study of Complex Formation of Uranyl with Nitrylacetic and Ethylenediaminoacetic Acid"; V.P. Shvedov, A.V. Stepanov, "Separation of Rare-Earth Isotopes by the Method of Continuous Electrophoresis"; M.M. Senyavin, I.Ya. Petrov, V.L. Karpov, V.A. Nikishina, "Radiation Chemical Stability of Ion-Exchange Resins"; V.P. Meshcheryakov, B.S. Kir'yanov, A.P. Smirnov-Averin, "Investigation of Radiation Stability of Some Extractants"; B.V. Ershler, M.A. Nezhevenko, G.G. Misishcheva, "Mechanism of the Radiation Decomposition of Hydrogen Peroxide";

I.V. Vereshchinskiy, "Radiation-Chemical Isomerization of Benzene"; A.K. Pikayev, P.Ya. Glazunov, "Study of the Effect of High Dosage Rate on Radiolytic Transformations in Aqueous Solutions"; Ya.M. Varshavskiy, V.L. Karpov, I.Ya. Petrov, Z.S. Bulanovskaya, "Deuteron-Exchange in Some Polymeric Systems by the Action of Gamma-Radiations"; A.M. Rozen, A.B. Anufriyev, "Electro-Model Study of the Kinetics of Separation in Cascade"; A.D. Bondar', "The Differentiation of Carbon Isotopes in Diffusion Processes"; N.G. Zaytseva, Lo Ven-chzhun, "Study of Valency State of Iodine Obtained on Splitting of Tellurium and Cesium by High Energy Protons".

The Section of Theoretical and Applied Electrochemistry [28] worked under the direction of Academician A.N. Frumkin; Deputy, Professor S.I. Sklyarenko; Scientific Secretary, T.V. Kalish, Candidate of Chemical Sciences.

([Note] The different sessions of this section were held under the chairmanship of: Academician A. Frumkin; Professor Ya.M. Kolotyrkin; Yu.Yu. Matulis, Corresponding Member, Academy of Sciences USSR; V.I. Veselovskiy; Academician Yu.K. Delimarskiy, Academy of Sciences Ukrainian SSR; Professor Ya.V. Durbin; L.M. Yakimenko, Doctor of Technical Sciences; Professor N.D. Tomashov; Professor B.N. Kabanov; Professor Yu.V. Baymakov.)

In the introductory address by A.N. Frumkin, and in the communications of L.M. Yakimenko, Yu.V. Baymakov, S.I. Sklyarenko and V.V. Stender, were considered the tasks that confront electrochemistry in connection with the expansion of electrochemical production during the Seven Year Period. Production of chlorine, which is closely connected with manufacture of high polymers, must not only be considerably increased in volume, but must also be raised to a higher technical level, by making use of electrolyzers of greater output capacity and by utilizing higher current densities. A considerable increase will take place in the relative proportion of mercury-cell electrolysis, the source of pure alkali that is needed for manufacture of synthetic fiber. Electrochemical methods of production of the rare metals -- indium and gallium, are becoming of great importance. Extensive expansion will take place in electrolytic production, from melts, of high melting point metals -- zirconium, tantalum, niobium, chromium, and titanium, which are needed in many new branches of technology.

In the communication of R.I. Agladze, were described the advances made during recent years in the industrial, electrolytic production of manganese metal and its compounds, in Georgia.

In a number of communications, mention was made of

the great potential importance of the methods of amalgam metallurgy, and consideration was also given to the fundamentals of electrolytic production of metals of a high degree of purity (paper by A.I. Nizhnik and others).

In the paper by N.A. Izmailov, were summarized the results of investigations conducted at the Khar'kov University, on behavior of electrolytes in non-aqueous solutions. The theory developed by the author makes it possible to set up a standard scale of acidity, which permits a quantitative comparison of the properties of acids in most diversified solvents.

At the session devoted to theory of solutions, the following papers were presented: "Electrode Characteristics of Glass and Their Significance in Theoretical and Applied Electrochemistry" (N.P. Nikol'skiy, M.M. Shul'ts, N.V. Poshekhonova, A.I. Parfenova, O.V. Mazurin); "The State of Hydrogen- and Hydroxyl-Ions in Aqueous Solutions and the Mechanism of Electric Conductivity" (N.Ye. Khomutov); "Significance of Temperature Factor in the Study of Properties of Aqueous Solutions" (I.S. Golinker).

At several sessions of this section, papers were presented dealing with numerous problems of kinetics of electrochemical reactions; diffusion kinetics and polarography; specific features of electrochemical reactions at semiconductor electrodes; electrochemistry of organic compounds; hydrogen overvoltage, etc.

In the paper by V.G. Levich, were described the results that are obtained on using a new kind of electrode -- a rotating disk electrode. Measurements carried out with such an electrode, at different speeds of rotation, make it possible to elucidate the mechanism of electrode processes which take place, for example, with participation of chlorine, and also detect unstable intermediate products which are formed at the surface of the electrode. Measurements of this nature are very important to the understanding of regularities of electrochemical processes.

Ya.M. Kolotyrkin and L.A. Medvedeva presented a paper on "Effect of Specific Adsorption of Anions on Hydrogen Overvoltage"; N.V. Nikolayeva-Fedorovich, O.A. Petriy and A.N. Frumkin described the polarographic behavior of halogen complexes of platinum; S.V. Gorbachev described the instant problems of macro- and micro-kinetics of electrochemical reactions.

Study of the effect of intermediate reactants on velocity of electrochemical processes was reported in the paper by M.A. Loshkarev, I.P. Chernobayev and B.I. Tomilov. A.G. Stromberg presented a paper on "Irreversible Waves in Polarography".

At the sessions of this section were also presented interesting papers dealing with problems of electro-deposition of metals (D.P. Zosimovich, B.N. Kabanov; A.T. Vagramyan, A.P. Popkov; N.T. Kudryavtsev, G.K. Smolenskaya, V.M. Karatayeva, R.G. Golovchanskaya and others); corrosion of metals (V.V. Andreyev, T.P. Stepanova, Ye.S. Volkova; I.V. Krotov; V.M. Berenblit, I.Ya. Lantratova, A.I. Shultin and others); electrolysis in chemical industry (G.I. Volkov, D.P. Semchenko, K.G. Il'in, and others); electrolysis of fused media (M.F. Lantratov, A.Ya. Alabyshev, and others).

Great interest was aroused by the paper of Yu.Yu. Matulis, "On the Mechanism of Electrode Processes which Cause Bright Electrolytic Coatings". At the session of the section, Yu.Yu. Matulis, President of the Academy of Sciences Lithuanian SSR, was honored in connection with his 60th anniversary.

Of interest were also the following papers: "Some Data on the Role of Admixtures in the Formation of Deposits of Latent Crystalline Type", by K.M. Gorbunova, Yu.M. Polukarov, O.S. Popova, A.A. Sutyagin; "Techniques of the Production of Chlorine and Alkalies by the Diaphragm Method", by G.M. Kamar'yan; "Adsorption of Anions and Passivity of Stainless Steels", by I.L. Rozenfel'd and V.P. Maksimchuk; "The Change in Kinetic Regularities of Oxidation of Metals in Water and in Aqueous Solutions of Neutral Salts, with Change in Temperature", by L.K. Lepin', A.Ya. Vayvade, A.K. Lokenbakh; "Polarography of Fused Salts", by Yu.K. Delimarskiy, K.M. Kalabina, T.P. Kaptsova; "Preparation of Electrolytic Tantalum and Tantalum-Niobium Alloy", by S.I. Sklyarenko, V.I. Konstantinov, Ye.A. Markina and V.M. Amosov; and others.

Great interest was aroused at the section by the papers presented by the foreign scientist: V.M. Kemulya [transliterated] (Polish People's Republic), on "The Use of the Hanging Drop Method in Electrochemistry", which concerns a new electrochemical method of analysis that makes it possible to detect contaminations in reagents of highest purity. The method is of great importance in the production of semiconductor materials, and in the study of the mechanism of electrochemical reactions in which take part various organic substances. By Sh. Lend'yel [transliterated] (Hungarian People's Republic), on "Extension of the Possibilities of Utilizing Concentration Cells for Determination of Transference Numbers in Concentrated Solutions of Electrolytes"; by W. Geisler and R. Landsberg (German Democratic Republic), "On a New Electrode for

Determination of Limit Current Caused by Hydrogen Ions"; by Yu. Khorituti [transliterated] (Japan), on "Use of Isotopes in the Study of Reaction of Hydrogen and Oxygen Electrodes"; by B. Kamenski (Polish People's Republic), on "Correlation between Surface Tension and Electrochemical Potential at Free Surface of Solutions"; by D. Semerano (Italy), on "Electrochemical and Spectroscopic Behavior of Organometallic Compounds"; by R. Landsberg (German Democratic Republic), "On Kinetics of the Process of Shielding of Metal Anodes".

In the adopted resolution, the section noted that for a fastest putting into practice of the grandiose plan of development of national economy of the Union during 1959-1965, outlined in the resolutions of the 21st Congress of Communist Party of Soviet Union, it is necessary widely to adopt electrochemical production methods in the chemical and metallurgical industry, and in other branches of industry.

The use of electrochemical methods in industry will permit, in many instances, a more economical organization of production, better utilization of raw materials, will ensure output of products of better quality with less expenditure of materials and labor. It is necessary to ensure a rapid rate of development of electrochemical methods of production of chlorine, caustic soda, and oxidizing agents, which constitute the foundation for production of many high-polymer materials, light, non-ferrous and rare metals which are needed in many branches of modern technology, for chemical sources of electric current used in communications, transport, and in cosmic flights. Development of machine building and of the production of goods manufactured by the light industry, is closely connected with wide utilization of the methods of electrolytic coating and electro-polishing. To ensure development of electrochemical industry, during these years, the following is necessary: expansion of scientific research and experimental work on theoretical and applied electrochemistry at the institutes of the Academy of Sciences USSR and of Union Republics, at the industrial institutes and departments of higher educational establishments, as well as at the principal electrochemical plants; organize at the large electrochemical plants experiment installations for final adjustment of the technology of new electrochemical production methods and for testing electrolyzers of new design; devote particular attention to expansion of work on such new, or lagging, branches of electrochemistry as electro-organic synthesis, electrochemistry of semiconductors, electrochemical methods of production of rare metals and

heat resistant coatings; develop work on increasing the size and output rate of electrochemical apparatus, so as to decrease capital investment in organizing production, and sharply to increase their economic efficiency; expand research aimed at improvement of working conditions at electrochemical plants; request the the electro- and machine building industry to initiate as soon as possible the production of mechanical and semiconductor-rectifiers designed for high current values, and of high output apparatus and machines for the electrochemical industry.

The Section of Metals and Alloys [29] worked under the direction of N.V. Ageyev, Corresponding Member, Academy of Sciences USSR; Deputy, Professor I.I. Kornilov; Scientific Secretary, R.S. Polyakova, Candidate of Technical Sciences. Work of the section started with an introductory address by Academician I.P. Bardin.

([Note] The different sessions of this section were held under the chairmanship of: Academician I.P. Bardin; Professor Ye.Ye. Cherkashin; Professor Ye.M. Savitskiy; Professor Ye.S. Makarov; Professor I.I. Kornilov; N.V. Ageyev, Corresponding Member, Academy of Sciences USSR.)

At the first session devoted to general questions of development of the chemistry of metal alloys and metals, a number of interesting papers were presented.

N.V. Ageyev, in his paper "Investigations of Metallic Systems in USSR", described the significance of fundamental principles of physico-chemical analysis in the study of metallic systems, the development of this branch of science in the USSR, and its extensive use in the production of alloys of great industrial importance.

I.I. Kornilov, in his paper "Metallochemical Properties of Elements of the Periodic System of D.I. Mendeleev", showed that the five families of metals, differentiated in the periodic system, make it possible to ascertain, on the basis of similarity of their chemical properties and atomic radii, periodic function of formation of metallic solutions and compounds, and to calculate the components which form solid solutions with a given metal.

Ye.M. Savitskiy, in his paper "Alloys of Rare Metals", showed that many of the rare elements produce beneficial effects on the properties of some alloys. For example an admixture of rhenium increases heat resistance.

At the session which was devoted to problems of thermodynamics, diffusion, specific heat of metal alloys, and intermetallide analysis, extensive papers were

presented by: A.M. Yevseyev, Ya.I. Gerasimov and A.V. Nikol'skaya, on "Thermodynamics and Structure of Metal Alloys"; A.Ya. Shonyayev, on "Effect of Chemical Forces on Diffusion Characteristics of Alloys"; K.G. Khomyakov, V.A. Troshkina, Yu.D. Tret'yakov, on "Study of Magnetic Properties of Alloys by the Method of True Specific Heat"; and by others. Of definite interest were the communications of Ye.Ye. Cheburkova and T.A. Borscheva (carbide- and intermetallide phases in nickel-, and iron-nickel base alloys); M.F. Alekseyenko, Ye.L. Bushmanova, L.V. Zaslavskaya, S.T. Kishkin, G.N. Orekhov, A.F. Platonov, N.M. Popova, G.M. Rovenskiy (effect of prolonged and repeated tempering on the state of carbide phase in heat resistant and construction steels); K.P. Sorokina, N.I. Blok, N.F. Lashko and M.N. Kozlova (boride phases in nickel-chromium based alloys).

At the session devoted to consideration of problems involving study of the structure of complex, intermetallic compounds based on heat resistant metals, Ye.S. Makarov presented a paper "On Molecules in Chemical Compounds of Variable Composition", which was followed by animated discussion. Interesting papers concerning new, ternary, intermetallic compounds, were presented by Ye.I. Gladyshevskiy, P.I. Kripyakevich and Yu.B. Kuz'ma.

At the later sessions were presented papers on topological theory of multiple-component systems, on studies of multiple-component, ternary and binary systems, and also on study methods, with the use of radioactive isotopes, of samples of varying composition and high-temperature thermography.

An animated discussion also followed the papers by: Yu.N. Andreyev, "Determination of Some Physical Properties of Metals on the Basis of Their Numerical Position Order in the Table of D.I. Mendeleev"; G.S. Zhdanov, "Superconductivity of Metals and Compounds, and the Periodic Law of D.I. Mendeleev"; V.K. Grigorovich, "Periodic Change in Structure and Properties of Elements". Great interest was aroused by the paper of G. Novotny (Austria) "On Crystallochemistry of Carbides and Silicides of Hafnium and Uranium".

In the evening of March 18th a joint session was held with the sections of Inorganic Chemistry and Physical Chemistry, devoted to the problem of semiconductors. Particular interest was aroused by the paper of N.N. Sirota, "Basic Regularities of Changes in Structure and Properties of Semiconductor Compounds Correlated with the Position of the Components in the System of D.I. Mendeleev". The paper by B.F. Ormont, "On Correlation between Some Thermodynamic, Mechanical and Electro-

Physical Characteristics of Semiconductors", dealt with questions of theoretical and practical interest. Much attention was given to the paper by L.D. Dudkin, "Some Problems of the Chemistry of Semiconductor Alloys", in which was presented a classification of binary semiconductor compounds, and a detailed study was made, from the standpoint of crystal-chemistry, of semiconductor compounds of transition metals.

Interesting papers were presented also by Z.G. Pinsker, on "Electronographic Study of the Structure, Composition and Nature of Chemical Bonding of Some Intermetallic Phases of Semiconductors"; Ya.A. Ugay -- "Compounds of Semiconductor Type and Metal Chemistry"; N.A. Goryunova -- "Formation of Chemical Compounds and Solid Solutions of Semiconductors on Heterovalent Substitution".

In the resolution concerning its work, the section noted that in view of the particular importance of metals, alloys, and semiconductor materials in the development of new technology, it deems it necessary considerably to expand work on physico-chemical analysis, study of diagrams of state, crystal chemistry of metallic alloys, particularly those based on light-, high-melting, and rare metals, and also on semiconductor materials.

The Section of Economics, Planning and Organizing of Chemical Production [30,59] worked under the direction of N.N. Nekrasov, Corresponding Member, Academy of Sciences USSR; Deputy, Professor N.P. Fedorenko; Scientific Secretary, A.L. Rabkina, Candidate of Chemical Sciences.

([Note] The different sessions of this section were held under the chairmanship of: N.N. Nekrasov, Corresponding Member, Academy of Sciences USSR; Professor S.A. Pervushin; Professor N.P. Fedorenko; Professor L.I. Raytburg; Professor A.I. Dzents-Litovskiy.)

At the first session N.N. Nekrasov presented a paper on "Economic Problems of Chemical Industry in the Seven Year Plan and the Problems of the Science of Economics".

In the papers presented at the section was summarized the work carried out by Soviet economists in making a study of economics of chemical industry, raw material bases and ways of their efficient utilization. It was shown what technical and economic advantages are afforded by development of industry of organic syntheses on the basis of petroleum and natural gas, and an economic substantiation was presented of efficient systems of the processing of hydrocarbons.

P.A. Khokhryakov and G.F. Borisovich presented a

paper on "Hydrocarbon Gas Resources and Main Trends of Their Utilization in the Chemical Industry". A.I. Ravdel' reported on the contemplated development of petroleum and gas-and-chemicals combines, in accordance with the Seven Year Plan. A number of papers dealt with problems of a composite utilization of substances, and of combined productions (N.A. Zeligman; V.G. Fridenberg; S.A. Pervushin; S.Ya. Rachkovskiy and others), and also with economics of the most important branches of chemical industry. In a paper on economics of the production of synthetic ethyl alcohol, N.P. Fedorenko and Ye.P. Shchukin showed, on the basis of an analysis of operation of some leading plants, the reserves that are available for increasing output of alcohol and lowering its prime cost.

Technical-economics shifts in the industry of synthetic rubber were described in the paper by N.P. Fedorenko and G.F. Borisovich. The large economic effects due to development of synthetic materials and their use in the national economy, were described in the papers of P.A. Borisov and A.L. Rabkina; I.V. Rostanin; G.Ye. Birger and Ye.P. Ivanova. A considerable number of papers dealt with economics of tire manufacture.

In its resolution, the section noted that the huge capital investments in the chemical industry, the tasks of lowering prime costs and raising productivity of labor, all of which follow from the directive figures specified in the Seven Year Plan of development of national economy of the USSR, necessitate a thorough study of ways toward achieving most efficient utilization of the material and labor resources.

The section called the attention of the Gosplan USSR, the Department of Economic Sciences of the Academy of Sciences USSR, State Committee on Chemistry of the Council of Ministers USSR, and of the Ministry of Higher Education USSR, to the necessity of improving and expanding work on economics of the chemical industry.

The section is of the opinion that the institutes of the Academy of Sciences and of Gosplan USSR, should be assigned the task of working out the problems of setting prices for raw materials and power supplies, determining economic efficacy of adoption of new technology, and capital investments for building of new, and modernization of operating enterprises, distribution of chemical industry by regions, in accordance with the development of national economy as a whole. Under the conditions of accelerated growth of combined chemical productions, an important problem is development of methods for computing total production and productivity of labor. The scientific-research institutes and the

planning institutes of the different branches of industry, and the newly established Scientific Research Institute of Technical-Economic Studies, of the State Committee on Chemistry, should expand work on economic problems of the chemical industry and particularly on location, combining, and specialization of chemical enterprises, modernizing of operating plants, uncovering of reserves available within the industry, enhancing productivity of labor and profits, on study of industrial coordination and efficiency, and also of utilization of the output of the chemical industry and procedures of economic study. At the chemical departments of higher educational establishments of economics, and at the divisions of economics of higher chemical educational establishments, should be undertaken, in collaboration with the scientific research institutes and the planning institutes, extensive economic studies of the urgent problems of development of the chemical industry.

The section noted the necessity of improving the training in economics at higher chemical educational establishments. Steps should be taken to increase the scope of literature being published on questions pertaining to economics and planning of chemical manufactures.

The Section of Chemical Engineering [31] worked under the direction of Professor A.N. Planovskiy; Deputy, Professor P.G. Romankov; Scientific Secretary, S.Z. Kagan, Candidate of Technical Sciences.

([Note] The different sessions of this section were held under the chairmanship of: Professor A.N. Planovskiy; Professor A.G. Kasatkin; Professor N.I. Gel'perin; Professor P.G. Romankov; P.I. Nikolayev.)

The papers presented at the section were divided according to the following subjects: general problems and hydrodynamic processes; thermal processes; processes of mass transfer.

At the first session, A.N. Planovskiy presented a paper on "Basic Trends of Development of Scientific Researches in Chemical Engineering". He emphasized the fact that accelerated expansion of chemical industry requires the solution of a number of urgent problems. They concern processes conducted in fluidized bed; the development of automatic, continuous operation apparatus for separation of fine suspensions; of thermal apparatus of high rate performance, operating at high pressure and temperature; of high output apparatus for rapid mass exchange. Interesting material was contained in the following papers: by A.A. Gukhman, P.G. Romankov, on the theory and methods of similitude, and their application to the study of processes of chemical technology; by S.Ya. Gzovskiy, on "Investigation of the Process of

"Mixing in Liquid Media"; by A.M. Lastovtsev, "General Regularities of Distribution of Drops by Size in a Spray"; by I.B. Rapoport, N.I. Gel'perin, V.Ya. Kruglikov and V.G. Aynshteyn, "Heat Exchange between Fluidized Bed and Surface of a Single Pipe in Longitudinal and Transversal Flow around the Latter"; by F.F. Zigmund, "Regularities of Heat Transfer under Transient Conditions"; by N.M. Zhavoronkov, V.A. Malyusov and B.I. Konobeyev, "Mass Exchange Studies in Thin Layers of Liquid at High Gas Velocities"; by L.D. Berman, "On the Influence of Concentration of Active Component, Difference in Partial Pressure and Shape of the Surface, on Mass Exchange Rate".

In addition to papers scheduled in the agenda, communications were presented at the section by the following: V.S. Kaminskiy, "New Designs of Centrifuges and Their Study by Means of Radioactive Isotopes"; A.I. Rychkov, "On Some New Forms of Presentation of Critical Equation of Heat Transfer on Boiling of Liquids"; D.I. Orochko, "Evolution of the Theory of Chemical Reactors"; V.M. Platonov, B.T. Bergo and M.E. Aerov, "Calculation of Rectification of Multiple Component Systems with Multipurpose Digital Computer"; A.K. Skryabin, "Use of Ultrasonic Waves to Intensify Liquid Extraction"; Ye.Ya. Susanov, "Use of Hydrodynamic Theory of Mass Exchange in Calculation of Rectification Columns".

At the session of the section, papers were also presented by foreign scientists: T.K. Sherwood (United States), "New Theorie of Mass Transfer under Conditions of Chemical Reaction"; Sh.S. Videnbaum [transliterated] (United States), "Mixing of Solids".

In its resolution the section noted that further productive development of the science of chemical engineering, and its maximum approximation to the solution of practical problems outlined by the Seven Year Plan of development of national economy, will require the following: expansion by every means of research, design- and experimental work on development of new, high-performance rate and high output capacity apparatus and machines operating under optimal conditions; develop further theoretical investigations, primarily in the direction of studies of kinetic regularities of basic processes of chemical technology on the basis of a thorough study of their physical nature; sharply to increase the volume of engineering research pertaining to chemical processes as such, and intensify the development of high-efficiency reaction apparatus of continuous operation, particularly for synthesis of monomers and polymers; combine to a maximum extent theoretical and experimental laboratory investigations with studies

conducted on a production scale. Study the question concerning the scientifically substantiated selection of the scale of enlargement on changeover from laboratory units to plant operation; provide, on the basis of theoretical, laboratory, and full-scale studies, reliable methods of design-calculations of apparatus and machines used in chemical technology; endeavor to derive, in studying processes of chemical technology, the widest possible generalizations from the secured experimental data, making use in so doing of the methods of the theory of similitude, in those instances when it is not possible to achieve an analytical solution of the equations of correlation that define the process; collaborate to a greater extent with physicists, experts in mechanics, and mathematicians, in solving theoretical problems of chemical engineering; expand the use of radioactive isotopes, of the method of electro-hydrodynamic analogy, high speed recording of motion pictures, etc. The following trends of scientific research are to be regarded as fundamental and of an immediate concern:

1. As concerns hydromechanical processes should study the regularities of hydrodynamics of fluidized bed; motion of two-phase flow in apparatus of column type; kinetics of processes of separation of heterogeneous systems (precipitation, filtration, centrifugation), and processes of mixing; develop and study new, high output capacity, filters, centrifuges, precipitation apparatus.

2. As concerns thermal processes: it is necessary to investigate heat exchange at high gas velocity; heat exchange involved in phase transition and chemical conversion; heat exchange in fluidized bed; search for new high-temperature heat transfer agents; develop and study new designs of high performance rate thermal apparatus (with silver-coated surfaces, plates, rotors, film-flow, continuous operation regenerators with granular material, etc.); study the effect of supersonic waves on intensification of heat exchange.

3. As concerns processes of mass exchange: develop and study new processes of mass exchange in fluidized bed and provide equipment for effecting them; study interaction of gas and liquid at high velocities, and develop apparatus for high speed mass exchange; study processes taking place in plate columns and packed columns, in apparatus of rotor-type, and develop efficient designs of absorption-, rectification-, and extraction apparatus; study heat- and mass exchange in capillary-porous bodies, in connection with drying, adsorption and desorption; develop new designs of high-efficacy driers and adsorbers

of continuous operation; study the effect of ultrasonic waves on intensification of processes of mass exchange; undertake composite studies of individual technological processes and chemical equipment, for the purpose of effecting their automation; expand research on derivation of equations of correlation which define processes, so as to ensure the possibility of regulation of manufacturing processes by means of computers and programmed regulators.

The Section of History of Chemistry and Chemical Technology [32] carried out all of its preparatory work under the direction of A.F. Kapustinskiy, Corresponding Member, Academy of Sciences USSR, who subsequently was unable to attend the congress due to sickness. At the congress, this section worked under the direction of the Deputies Section Leaders -- Professor N.A. Figurovskiy and Yu.I. Solov'yev, Doctor of Chemical Sciences; Scientific Secretary, K.Ts. Yelagina, Candidate of Chemical Sciences.

([Note] The different sessions of this section were held under the chairmanship of: Professor N.A. Figurovskiy; Academician A.Ye. Arbuzov; Professor P.M. Luk'yanov; Yu.I. Solov'yev, Doctor of Chemical Sciences; Professor Yu.S. Musabekov.)

At the sessions of this section the following subjects were considered: general questions concerning the history of chemistry; the significance of the work of D.I. Mendeleev in the history of chemistry; experimental methods in chemical research of historic significance, and questions of methodology; questions pertaining to history of organic and physical chemistry; unpublished materials found in the archives. The paper dealing with the principal problems of scientific treatment of the history of chemistry was presented by N.A. Figurovskiy.

In connection with the 125th anniversary of the birth of D.I. Mendeleev, which occurred on the 8th of February, and the 90th anniversary of the Periodic Law (March 16), a considerable number of the papers were devoted to description of new, or little known, aspects of the work of this great scientist, and of the significance of his contributions.

On this subject much has been added by the Leningrad historians of chemistry, particularly by the associates of the Archives of D.I. Mendeleev at the Leningrad State University. New archival materials concerning the periodic law were described by B.M. Kedrov.

A.Ye. Arbuzov spoke of his recollections of D.I. Mendeleev, whom he had met at the sessions of the

Eleventh Congress of Russian Naturalists and Physicians, at Petersburg, in 1901.

Interest was aroused by the paper of A.A. Berlin and S.R. Rafikov, "Principal Stages of Development of the Chemistry of High-Molecular Compounds". In a number of papers were reported new, not previously known data concerning the scientific work of J. Berzelius (Yu.I. Solov'yev), E.G. Laksman (N.M. Raskin), T. Grotgus (Ya.P. Stradyn'), V.M. Rodionov (K.Ts. Yelagina), and others. Interest was aroused by the paper of A.Kh. Aratyunyan, "Fragments of an Armenian Manuscript of the XIV-XV Century".

In addition to papers dealing with methodology of studies of the history of chemistry (Yu.S. Musabekov, G.V. Bykov, and others), there were presented at the section papers based on utilization of chemical experiments as a means of study of specific questions of chemistry and technology (A.M. Bezborodov, I.L. Znachko-Yavorskiy, and others).

The Symposium on Higher Chemical and Technological Education [33,34] worked under the direction of Docent N.S. Torocheshnikov; Deputy, Professor K.P. Mishchenko; Scientific Secretary, T.B. Bomshteyn, Candidate of Technical Sciences.

([Note] The different sessions of the symposium were held under the chairmanship of: M.A. Prokof'yev, Deputy Minister of Higher Education USSR; Docent N.S. Torocheshnikov; Professor K.P. Mishchenko.)

At the first session, following the introductory address by M.A. Prokof'yev, a paper was presented by N.S. Torocheshnikov, "On Measures Aimed at Improvement of the Training of Specialists for the Chemical Industry". The paper described the primary tasks confronting the establishments of higher education in connection with the putting into effect of the resolutions of 21st Congress of Communist Party of Soviet Union, and May Plenum of Central Committee Communist Party of Soviet Union, concerning accelerated development of chemical industry, and the problems involved in reorganizing the work of the higher schools in accordance with the "Law on Strengthening the Ties between Schooling and Practice and a Further Development of the Educational System of USSR".

At the symposium were considered the general questions concerning training of engineers-technologists for the industries utilizing chemical technology; of research chemists at the universities, and research engineers at the technological institutes; of mechanical engineers for chemical machine building and operation of machines and apparatus of chemical industry; of specialists of automation of technological processes.

Papers were presented by: S.I. Vol'fkovich, B.I. Kissin, B.A. Poray-Koshits, V.M. Dziomko, A.V. Novoselova, Ya.I. Gerasimov, I.P. Alimarin, S.I. Shchepkin, I.Ya. Klinov, P.V. Dybina, and others.

Papers concerning ways of improving the practical and theoretical training of students were presented by: F.Ya. Kul'ba, P.A. Bezsonov, Ye.I. Akhumov, V.B. Avilov, V.A. Zinov'yev, A.F. Landa, V.V. Stender, N.A. Preobrazhenskiy, and others.

S.Ya. Pasechnik reported on means and manner of improving the training of engineers. A paper "On Training of Scientific Cadres for Higher Educational Establishments and Research Installations" was presented by K.P. Mishchenko. Questions of publication of textbooks, manuals, periodicals, and reference books, were discussed in the papers by V.A. Kireyev and others.

Other speakers at the symposium were: G.A. Razuvaev, B.N. Dashkevich, M.T. Kozlovskiy, D.V. Sokol'skiy, Yu.K. Yur'yev, A.B. Pakshver, N.P. Pyatnitskiy, A.G. Ignatov, N.N. Lebedev, P.G. Romankov, I.F. Ponomarev, N.I. Chernozhukov, M.A. Menkovskiy, Yu.N. Gorokhovskiy, I.N. Putilova, F.M. Shemyakin, V.I. Vul'fson, K.G. Kono-pel'ko, V.I. Semishin, V.A. Astakhov, Ya.B. Barkan, Ya.N. Yampol'skiy, Ye.K. Tagarshak, etc.

The communications of the 45 participants of the symposium contained many useful and interesting suggestions concerning improvement of the work of higher educational establishments and on strengthening their ties with industrial practice.

The recommendations prepared by 6 commissions and approved by the symposium for submittal to the Ministry of Higher Education and to higher educational establishments, point out the necessity of intensifying the training of engineers-technologists and of researchers in the following fields: polymers, application of atomic energy in chemical technology, for radiochemical processes, automatic regulation, corrosion of chemical equipment; of organic analytical chemists, in pure chemical reagents, chemistry of silicon, etc. On revising the programs of many courses it is necessary to take into consideration the problems connected with the use of hard radiations, ultrasonic waves, high frequency currents, and other subjects which should be substituted for obsolete and subordinate matters. It is recommended to stress in training of chemical engineers the topics of research; increase the time allocated to work on theses in the training of research chemists, and improve facilities for carrying out this work. It is recommended to engage more industrial specialist in higher educational

work, on a part time basis, to teach applied science and special optional courses, and to afford them certain advantages as to the place of their employment. In order to train specialists for main laboratories of plants it is advisable to assign each year up to 10% of the graduates of higher technical educational establishments, for a period of 2 years, to departments where they can undergo specialized, advanced training, as research students and junior scientific associates.

The symposium recommended to the ministries of education of Union Republics to make wider use in teaching chemistry and physics at the secondary schools, of the personnel of chemical laboratories of large chemical enterprises, scientific research institutes and higher educational establishments.

The symposium adopted some fundamental postulates concerning theoretical training of students at higher chemico-technological educational establishments; training of scientific cadres for higher education, research establishments and main plant laboratories; nature and course of advanced training of engineers; teaching of chemistry at nonchemical higher educational establishments; publication of chemical texts; improvements in the study of chemistry, physics, and foreign languages at secondary schools.

In the work of the symposium took part more than 700 persons, including 24 foreign guests from 6 countries.

At the session of the symposium interest was aroused by the paper of L.I. Gutenmakher and G.E. Vleduts, "The Prospects of Building and Utilizing Chemical Information Machines".

The Commission on Chemical Nomenclature worked under the direction of A.P. Terent'yev, Corresponding Member, Academy of Sciences USSR; Deputies, V.A. Abramov; G.P. Luchinskiy, Doctor of Chemical Sciences; Scientific Secretary, A.M. Tsukerman.

For discussion by the participants of the congress were submitted the projects of nomenclature of inorganic [35], organosilicon [36], and organic (Part 1. Acyclic Hydrocarbons) compounds [37], prepared by a number of authors, under the direction of A.P. Terent'yev, at the Department of Chemical Sciences of the Academy of Sciences USSR. The nomenclature of inorganic compounds, used in the current Russian chemical literature, requires considerable standardization. The most important attempts to standardize Russian nomenclature of inorganic compounds were the projects submitted by the commissions on nomenclature of the sixth Mendeleev Congress in 1932 [38] and of the All Union Chemical Society imeni

D.I. Mendeleev in 1937 [39]. A survey, critique, and proposed amendments of nomenclature of organic compounds were published as a monograph [40]. In order to standardize the nomenclature of inorganic compounds the Commission on Nomenclature of the International Association of Pure and Applied Chemistry had worked out, in 1953, a model project of rules of nomenclature of inorganic chemistry.

The projects of nomenclature submitted to the participants of the congress were prepared by taking into account the earlier projects of revised Russian chemical nomenclature, as well as the international model projects.

The main work on consideration of the projects was conducted by three sub-commissions: on inorganic compounds (Chairman A.V. Lapitskiy; Secretary G.A. Bergman); on organic compounds (Chairman A.N. Kost; Secretary V.V. Rode) and on organosilicon compounds (Chairman M.G. Voronkov; Secretary S.N. Borisov).

In the resolutions adopted by the Commission, after extensive discussion of all the materials, it is stated that the project of nomenclature of inorganic compounds, including the corrections made by participants of the congress, should be published in the Journal of Inorganic Chemistry, for wide dissemination and use; the project of nomenclature of organic compounds (Part 1. Acyclic Hydrocarbons) should be published, for the same reason, in the Journal of General Chemistry; the project of nomenclature of organosilicon compounds should also be published, after some particularizations, in the Journal of General Chemistry.

The participants of the congress approved the work of the Commission on Nomenclature of the Department of Chemical Sciences of the Academy of Sciences USSR, and made the recommendation that the commission continue its work on preparation of nomenclatures of all classes of chemical compounds, including also those of organo-elemental, natural and high-molecular compounds. It is desirable to increase the membership of the Commission and to undertake and coordinate the working out of nomenclatures in the languages of the Nationalities. All materials on preparation of nomenclatures should be published periodically in the journal of All Union Chemical Society imeni Mendeleev -- "Chemical Science and Industry". It is deemed necessary that the Department of Chemical Sciences of the Academy of Sciences USSR call in 1960 a special conference on nomenclature of chemical compounds.

At all sessions of the Sections the participants of the congress expressed their gratification by the

resumption of convocations of the Mendeleev Congress.

The numerous papers of Soviet chemists, presented at the congress, pertained to the solution of prospective problems of development of chemical industry and chemization of national economy. These papers constitute an important contribution to the putting into effect of the Seven Year Plan of development of national economy, adopted by the 21st Congress of Communist Party of Soviet Union.

The congress had also considered numerous theoretical, methodological, and exploratory contributions the putting to use of which will speed up considerably the development of Soviet science and will be of value to Soviet technology.

The Symposium on Higher Chemical and Technological Education has considered important questions concerning methods of further amelioration of the training of highly skilled specialists, viewed in the light of the law promulgated by the Supreme Soviet of the USSR on development of education.

The diversity of the papers presented at the sections of the congress, encompassing all the divisions of chemical science and industry, aroused tremendous interest of all chemists of USSR. The congress has made it possible for a large number of chemists to get together and to exchange view concerning various scientific problems.

As many as 50% of the speakers at the sections were young people who took part for the first time in such an important scientific event.

The Soviet chemists have been told of the advances of chemical science and technology abroad, by outstanding scientists from different countries. While noting the extensive development of scientific research in chemistry and chemical technology the sections of the congress ascertained that, at the congress, the work of plant laboratories did not contribute an adequate share, and that in many of the divisions the same is true of the work of institutes of industrial branches, educational departments, and some branches of Academies of Union Republics.

Between convocations of Mendeleev Congress, conferences and meetings on pertinent problems of chemical science and technology should be called, and some sections of the congress have advocated the calling of Mendeleev Congress on specific topics.

The principal suggestions made by sections of the congress are as follows:

1. It is desirable to hold a Mendeleev Congress at intervals of 3 years.

II. A House of Chemistry should be established in Moscow, including halls for holding meetings and conferences, exhibitions, a library, laboratories, club, etc.

III. While noting a satisfactory development of individual branches of chemical science, the sections have also ascertained the necessity of widening the theoretical and experimental work dealing with a number of new important trends.

IV. Suggestions have been made concerning the desirability of establishing new scientific institutes; of permanent colloquies at some cities; of the periodically held meetings and conferences on various problems.

It has been suggested that more attention should be given to improving the work of plant laboratories, that the salaries and other legal rights of the workers at these laboratories be made uniform; that scientific and technical supervision by scientific and higher educational establishments be set up over some of these laboratories and chemical enterprises.

V. Suggestions have been made of the necessity of increasing the publication of chemical literature: of reference books, textbooks and monographs, including some on methods of synthesis of organoelemental compounds, of a textbook of chemistry of organoelemental compounds; of increasing the volume of a number of the scientific periodicals that are being published, for example the "Colloidal Journal"; of publishing new periodicals: on theoretical and applied electrochemistry, agricultural chemistry, fertilizers and pesticides, corrosion and its control; of a journal for chemical workers; of increasing the publication of literature on economics and planning of chemical production; speeding up publication of the Annual Index of the Journal of Chemical Abstracts.

Attention has been called to the necessity of providing the Goskhimizdat with better printing facilities, larger personnel and buildings.

VI. A number of sections called the attention of the Ministry of Higher Education USSR to the necessity of revising the training program of higher education of a number of specialists, so as to greatly increase its scope. This applies particularly to training of electrochemists, and specialists in the new methods of analysis and instrumentation, etc.

Total Number of Papers and Communications  
Submitted or Read at Sections of Congress

Section	Number of all papers and communications	By foreign participants of congress
Inorganic Chemistry	135	11
Organic Chemistry	242	8
Analytical Chemistry	69	8
Physical Chemistry	106	8
Colloid Chemistry	63	2
Chemistry of Polymers	82	3
Chemistry of Natural Compounds and Biochemistry	99	2
Agricultural Chemistry, Fertilizers and Insectofungicides	37	1
Chemistry and Technology of Fuel	67	3
Chemistry and Technology of Food Products	72	1
Chemistry of Silicates	65	2
Radiochemistry and Chemistry of Isotopes	47	2
Theoretical and Applied Electrochemistry	91	7
Chemistry of Metals and Alloys	52	1
Economics, Planning and Organization of Chemical Production	27	1
Chemical Engineering	78	2
History of Chemistry and Chemical Technology	32	1
Symposium on Higher Chemical and Technological Education	52	1
Commission on Chemical Nomenclature	3	1
Total	1419	60

The papers read at the sections of the congress, symposium, and commission on nomenclature, were submitted by chemists from 81 cities and 15 Union Republics of USSR. Five hundred seventy one papers were in the name of 982 chemists from other cities. Higher educational establishments of USSR submitted 548 papers or 38.6% of the total. Institutes of the Academy of Sciences USSR and of Union Republics submitted 516 papers or 36.3%, enterprises and establishments of the State Committee on Chemistry, Sovnar-khozes [National Economy Councils], etc., -- submitted 348 papers or 25% of the total.

In addition to attending the scientific sessions, the delegates and foreign guests of the congress had the opportunity to visit scientific institutes, enterprises and cultural establishments [41].

During the holding of the congress, exhibitions were opened in the main building of the Moscow State University (at Leninskiye Gory): an exhibit of photographs, including 10 divisions, depicting the life and work of D.I. Mendeleev, assembled from materials of the Museum-Archives of D.I. Mendeleev at the Leningrad State University imeni A.A. Zhdanov; an exhibit of chemical literature (history of chemistry in our country, scientific, educational, and reference literature, domestic and foreign periodicals and bibliography over the 1954-1958 period), organized by a number of libraries: of the Department of Chemical Sciences of the Academy of Sciences USSR; State Committee on Chemistry at the Council of Ministers USSR; Central Polytechnic Library; Library of the Institute of History of Natural Sciences and Technology, of the Academy of Sciences USSR; an exhibit of chemical reagents -- prepared by the "Soyuzreaktiv" trust.

The congress was attended by 155 foreign chemists from 19 countries (Bulgarian People's Republic, Hungarian People's Republic, German Democratic Republic, Korean People's Democratic Republic, Chinese People's Republic, Czechoslovak People's Republic, Federal People's Republic of Yugoslavia, Austria, Belgium, Great Britain, Holland, Italy, United States, France, German Federal Republic, Switzerland, Japan).

The foreign guests presented 60 papers at the different sections of the congress [42,43]. In addition, some of the foreign scientists delivered lectures at the Leningrad Branch of the All Union Chemical Society imeni D.I. Mendeleev (C.K. Ingold -- England, G. Wittig -- German Federal Republic, S. Uinshteyn [transliterated] -- United States), and also took part in seminars at various institutes -- S. Thompson (United States), A. Giorso [transliterated] (United States), and others.

In the work of the congress took part representatives of the International Association of Pure and Applied Chemistry: its President, A. Shtol' [transliterated] (Switzerland), General Secretary, R. Morf (Switzerland), and members of the Executive Committee, W. Klemm (German Federal Republic), M. Letor [transliterated] (France). Most of the foreign scientists stated that participation in the work of the congress was of considerable interest to them. In their letters, in the interviews with Soviet scientists and newsmen, and in the foreign press, numerous foreign scientists expressed their satisfaction with the scientific advances and with the organizational aspects of the congress [44].

At the closing plenary session of the congress, on 23 March 1959, which was held at the Assembly Hall of the Moscow State University, the participants of the congress approved, with vigorous applause, the text of a message to the Central Committee of Communist Party of the Soviet Union [45], in which the workers of chemical science and industry express their determination to further by every means the putting into effect of the plan, formulated by the Party, of accelerated development of chemical industry.

The congress also approved the text of an appeal to all the chemists of the Soviet Union [45]. In it, the participants of the congress stated that they are firmly convinced that Soviet chemists will apply all their initiative, skill, and efforts, to fulfill the great task of communist endeavor assigned to the Soviet people by the 21st Congress of Communist Party.

At this session Dimitr Ivanov (Bulgarian People's Republic) addressed the audience on behalf of the foreign participants of the congress, to thank Soviet chemists for their hospitality and to express the satisfaction of all foreign guests with the success of the congress. In his speech he said:

"Between the sessions and while visiting scientific research institutes we had ample opportunity to meet famous Soviet chemists as well as their associates. These personal contacts will unquestionably promote further development of chemistry in our countries.

...There can be no doubt that the Eighth Mendeleev Congress will play an important part in the fulfillment of the grandiose tasks that will confront Soviet chemists during the forthcoming years".

In his concluding address, the Chairman of the Organization Committee of the Congress, Academician A.N. Nesmeyanov, said: "Comrades, our congress is nearing its end. It was the best attended and the most

representative of them all. It was most rewarding in its content.

The numerous contributions of Soviet chemists were connected with the solving of pertinent problems of development of chemical industry and chemization of national economy. We hope that these contributions will add substantially to the fulfillment of the great Seven Year Plan of development of national economy adopted by the 21st Congress of Communist Party.

It is quite natural that at the congress particular attention was focussed on problems of synthetic materials, especially those of high molecular nature, on organic syntheses based upon utilization of natural gas, petroleum, coal, wood, on utilization of mineral raw materials for the production of mineral fertilizers and chemical agents for plant protection, and also on problems of chemical machine building, chemical engineering, and production of new metallic alloys and silicates.

The congress has also considered many theoretical, procedural, and exploratory investigations, the putting to use of which will considerably accelerate development of Soviet science and be of value in technology.

The congress has devoted much attention to problems that combine chemistry with biology and physics. Many valuable papers were concerned with agricultural chemistry, biochemistry, chemistry of medicinals and food products. Widely represented were the creative contributions of Soviet physical chemists, particularly those concerning structure of matter, kinetics, catalysis of chemical reactions, theoretical and applied electrochemistry, colloid chemistry, surface-sorption phenomena, corrosion, and many others ...

Of considerable interest were papers dealing with new work on chemistry of radioactive elements, isotopes, the use of these substances in scientific research, and also with the rapidly expanding field of radiation-chemical reactions.

Special sections of the congress were concerned with important problems of economics, planning and organization of chemical production, and also with history of chemistry and chemical technology.

A large number of participants attended the symposium on higher chemical and technological education which considered, in connection with the recent decree of Supreme Soviet of USSR relating to higher and secondary education, important questions of methods aimed at further improvement of the training of highly skilled chemists and chemical engineers.

Particular mention should be made of the active

participation in the congress of numerous foreign chemists from 19 countries.

"Altogether, approximately 1500 original contributions were reported at the congress, of which 9 were papers on problems presented at plenary sessions. The work of the congress was conducted at 17 sections with 13 sub-sections. The total number of participants of the congress exceeded 5 thousand persons, and on certain days it reached 10-11 thousand persons. Delegates to the congress were elected by elected by local organizations of the All Union Chemical Society imeni D.I. Mendeleev and by the Organization Committee of the congress. The number of delegates and of those who were invited amounted to 2200 persons. In connection with the congress there were published 26 volumes containing the texts and abstracts of papers, and the "Outline of History of the Chemical Societies in the Soviet Union" written by Professor V.V. Kozlov ...

The congress received messages of greeting and gifts -- from the Chemical Society of Chinese People's Republic, from chemists of German Democratic Republic, from a group of chemists in the United States, and from others. I wish to express on behalf of the Organization Committee, and I hope also on behalf of all the participants of the congress, a profound gratitude for these manifestations of friendship.

I also wish to thank, on behalf of Soviet chemists, our foreign delegates for their attendance and for the active participation in the work of the congress. I believe that I am expressing our unanimous opinion in saying that we were very glad to have them with us, to have them read their valuable papers, to talk with them about scientific and technical problems of common interest.

We wish to maintain and develop in the future friendly scientific connections with our foreign colleagues, to further the cause of peace and progress.

Allow me to express, on behalf of the congress, much gratitude to all the Comrades whose efficient and hard work has made it possible to arrange and hold the congress, which, to tell the truth, was not an easy undertaking. Particular mention should be made of the great volume of exacting work performed by the Chief Scientific Secretary of the congress -- Professor V.V. Kozlov, and by all the associates of the Secretariat of the congress, business management and Publishing House of the Academy of Sciences USSR, and also by the All Union Chemical Society imeni Mendeleev, headed by its esteemed President -- I.P. Losev. I hereby declare

the Eighth Mendeleev Congress closed".

During and after the termination of the congress there were published in the Soviet and the foreign press numerous reviews, articles, interviews of correspondents of newspapers and journals with participants of the congress, concerning its results and the impressions made upon them by the work conducted at the section and plenary sessions [46-59]. In summarizing these reviews and comments, it can be said without exaggeration that the Eighth Mendeleev Congress was an outstanding event in Soviet chemistry. It was very wide in scope, reflecting thereby the vigorous growth of chemical science and technology, their widest utilization in diverse branches of national economy and cultural life. The congress gave proof of the great creative potentialities of Soviet chemistry, of the rapid quantitative and qualitative growth of chemical cadres. At the congress were discussed the urgent problems of development of Soviet chemistry, in the light of the recent resolutions of Communist Party and Soviet Government, concerning accelerated development of chemical industry. Finally, the congress helped the young people to become acquainted and to talk with chemical experts -- members of the older generation, and also with foreign scientists. Of great value were also the meetings of chemists with the representatives of physics, biology, engineering, economics, and also of medicine, agriculture, and other branches of science and technology.

The Eighth Mendeleev Congress has demonstrated once more that the immortal work and ideas of D.I. Mendeleev continue to live and undergo creative development, steadily adding to the fund of science and technology new discoveries and achievements.

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